AUDIO VISUAL COMMUNICATION REVIEW

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ERRATA

The references on pages 55-56 should accompany the article, entitled "Some Observations on Communications Theory" by Dallas W. Smythe, pages 24-37.

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A THEORY OF PICTORIAL PERCEPTION[1]

•JAMES J. GIBSON

A long-range program of audio-visual research should comprise two distinguishable if sometimes overlapping types of activity: First, the conduct of experiments to test the comparative value of alternative forms of training-film presentation, some of which, at least, can be applied relatively immediately to improve the effectiveness and/or economy of current training. Second, development of theory and principles about basic factors underlying the phychological functioning of audio-visual materials as aids to learning and perception, which, while often not immediately applicable to practical problems, are essential for continued, long-range progress. This report, prepared by Professor James J. Gibson of Cornell, falls into the latter category. It is a first attempt to develop a systematic theory of pictorial perception, and, accordingly, is addressed primarily to those concerned with theory and research rather than those whose preoccupation is with immediate practical training problems. The study was undertaken on the grounds that a satisfactory theory comprehending the basic psychological factors governing the perception of pictorial material is a prerequisite to effective long-range progress in research directed toward better understanding and prediction of the effects of audiovisual training materials.

As in all initial attempts at theory development, the present formulation is tentative in nature, and it is to be expected that both minor alterations and major changes in the formulation offered here will be necessary as implications of the theory are assessed critically and tested experimentally. The present report represents a second revision of an original paper, prepared under this contract, which has been reviewed critically by several leading psychologists in the field of visual perception. Despite the manifestly provisional and incomplete nature of the theoretical ideas here presented, they are believed to represent an important contribution both to psychological theory and to the ultimate development of a science of audio-visual instruction. Their usefulness in both these directions will be directly proportional to the extent to which students and experimenters in these fields are able to verify or refute the theoretical propositions by subjecting them to experimental test.

A. A. LUMSDAINE
S. M. ROSHAL

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A DISTINCTION is possible between what is commonly called experience at first hand and experience at second hand. In the former one becomes aware of something. In the latter one is *made aware* of something. The process by which an individual becomes aware of something is called perception, and psychological investigators have been concerned with it for generations. The process by which an individual is made aware of something, however, is a stage higher in complexity, and this has scarcely been touched upon by modern experimental psychology. It involves the action of another individual besides the perceiver. Although a precise terminology is lacking for this two-stage process, it is readily described in ordinary language: we speak of *being informed, being told, being taught, being shown, or being given to understand.* The principal vehicle for this kind of indirect perception is, of course, language. There is another vehicle for obtaining experience at second hand, however, and this is by way of pictures or models. Although much has been written about language, there is no coherent theory of pictures. The attempt to analyse how a picture conveys information is a necessary but highly ambitious undertaking. The following essay cannot claim to do anything but set up working hypotheses for an important field of investigation.

I. Words, Pictures and Models as Substitutes for Realities

An obvious fact about perception is that it is different for different things, that is, our percepts are specific to the various features of the physical environment surrounding us. We discriminate among these features and we can identify objects, places, and events when we encounter them on another occasion. This discriminating and identifying of things is an important part of what goes on when we say that we *learn.* Learning requires not only that we make the appropriate reactions but also that we be sensitive to the appropriate stimuli. An important aspect of education, or of any kind of special training, military, industrial, or professional, is an increasing ability to discriminate and identify things.

The training situation, however, is not always the same situation as that for which the individual is being trained. This fact holds for the child at home, the student at school, and the military trainee before he sees action. The learner must ordinarily be given an acquaintance with objects, places, and events which he has never physically encountered. The expedient is to train the individual in

artificially constructed situations and expect that his learning will *transfer* to the novel situation, and this is essentially what any teacher does. The artificial construction of these situations is the crux of the matter. They must present adequate substitutes for the objects, places, and events later to be met with, if the latter are to be successfully discriminated and identified. The teacher can use oral and written words to induce this kind of secondhand experience, to "arouse an image," but he has always felt the need for other substitutes in addition. Pictures, films, drawings, models, and displays, along with diagrams, graphs, charts and maps are also, he is convinced, useful. Precisely why they are useful needs to be understood.

What kinds of substitute-stimuli are best for informing or teaching, or which kinds are better for what purposes? What are the advantages of pictures and motion pictures? What are the advantages of words? What are the limitations of both? Should pictures be realistic or schematic? Do pictures reproduce the perception of real three-dimensional space? These are all practical questions, but they involve difficult theoretical problems.

II. Definition of the Term "Surrogate"

In order to understand how pictures convey information it will be necessary to have some general theory of how information is conveyed. Before attempting to specify the difference between pictures and words we should examine them to see how they are alike. The term *surrogate* is proposed to cover both, and a theory of surrogates will be formulated as a first step toward a theory of pictures.

The traditional or commonsense explanation of how one man conveys information to another is simply that men have ideas, and that ideas are transmitted. The idea is said to be "expressed" in language, the words "carry" the idea, and the idea is then "grasped" or "taken in." An idea may be expressed by a picture as well as by words. It is hardly necessary to point out that this is no explanation at all. The "transmission of ideas" by words and pictures implies, when taken literally, that these vehicles carry their ghostly passengers unaltered from one mind to another. We shall therefore dispense with the term "idea" and state our definitions in terms of behavior.

A surrogate will be defined as a *stimulus produced by another individual which is relatively specific to some object, place, or event*

not at present affecting the sense organs of the perceiving individual. The implications of this definition should be explored both for what it includes and what it does not include. It says, in the first place, that a surrogate is an artificial stimulus constituted or produced by the behavior of another organism. Consequently, a surrogate is *not* the same thing as a substitute stimulus or a preparatory stimulus or a conditioned stimulus, as these are ordinarily defined in psychology, for these include merely physical conjunctions of events. Clouds are not a surrogate for rain, nor is the smell of food a surrogate for food. These are *signs*, but not surrogates.

In the second place, the definition says nothing about what the stimulated individual will *do* in the presence of a surrogate. All it implies is that he may have a kind of mediated or indirect perception of what the surrogate is specific to. It is true, of course, that perception is a form of organic response, but this kind of response probably has the primary function of identifying or discriminating features of the environment; it is implicit rather than overt and it does not in any reliable way tell us what the individual will do.

Thirdly, the definition implies the action of one individual on another, a social influence, or an elementary form of communication, but the emphasis is on one aspect of communication only. The definition is concerned with the *mediating of a perception* rather than the *arousing of an action* in one's fellow man. Long ago, De Laguna pointed out that speech had two general functions, that of "proclamation" and that of "command" (3). An act of speech might at one extreme merely proclaim the existence of a certain state of affairs, or at another extreme merely command a certain action. Usually it did both, but the two functions were said to be distinguishable. More recently, Skinner has distinguished between the "tact" and the "mand" in verbal behavior (12). Many social scientists have contrasted the transmitting of knowledge with the effort to control action, or "information" as against "propaganda." Surrogate-making as here considered, then, will apply only to the first kind of communication, not to the second. A general theory of communication including the function of persuasion would require many definitions and assumptions about human motivation and conduct, and is a greater undertaking than the writer here intends. The present theory is admittedly incomplete.

Fourthly, the definition says that a surrogate must be relatively specific to an absent object, place, or event. "Specific" here means a one-to-one relationship between different surrogates and

different things; it does not mean that the things specified are necessarily concrete objects or particular places or never-to-be-repeated events. On the contrary, they may be abstract or universal things. Evidently the meaning of specificity is a crucial part of the definition. (Perhaps it is also the part of the theory to follow which most needs criticism and elaboration.) The specificity of surrogates to their referents is analogous to what was called an obvious fact about direct perception—that it is different for different physical things. We assume that direct perceptions correspond to realities, or rather that they come more and more to do so as the perceiver learns. Accordingly we are primarily interested in how perceptions *mediated by surrogates* also come to correspond to realities. Clearly, this kind of apprehension can only be specific to a referent if the intervening surrogate was itself specific to a referent in the first place. The interesting fact about the specificity of a surrogate is that it depends on the psychological activity of its producer, that is, on the precision of *his* apprehension. Surrogate-making, whether it be naming, drawing, or modelling in clay, consists largely in what the writer has elsewhere called *identifying* reactions (5).

The above definition of surrogates may usefully be compared and contrasted with a recent explicit definition of *signs* by Charles Morris (11). The present formula owes much to his rigorous discussion, but there are fundamental differences between them. Morris distinguishes between *iconic* signs and *non-iconic* signs. The former include images and pictures; the latter include words. Morris understands that no sharp line can be drawn between them. But he has very little to say about the former and his theory is applied not to them, but to language. In contrast, the present theory is directed toward pictorial communication and language is slighted. A surrogate as defined here is less inclusive than a sign as defined by Morris, in that the former is always something produced by an organism whereas the latter may be any feature of the stimulating situation. Moreover, surrogates exclude in large part the difficult category of "expressive" or "emotive" signs, that is, reactions which are specific to the state of the organism rather than to the features of his environment. The present emphasis, in short, is cognitive.

III. The Production of Surrogates

Human organisms are chronic makers of surrogates. Some of their reactions yield only temporary stimuli (sounds, gestures, and

so-called expressive movements) while others yield permanent stimulus-objects (picture-making, modelling, writing). It would be useful to classify and list, first, the fundamental motor acts which either constitute or produce surrogates and, second, the complex motor acts or technologies which man ha learned for producing them. These sources of stimulation are necessarily such as always to be either easily seen or easily heard by normal perceivers.

The fundamental motor acts are (a) the making of vocal sounds, such as cries or speech; (b) the making of movements of the face, hands, arms, or body, which includes gestures, postures, and mimicry; (c) the making of tracings on a surface of some kind, which includes drawing, painting and the special case of writing; (d) the shaping of a substance by moulding it, cutting it, or fitting pieces together, which includes sculptures, toys, and models of all kinds, and finally; (e) the making of mechanical sounds by manipulating an instrument or blowing into it, which includes sound-signalling and above all, music. If this list is exhaustive, it suggests that there are only a limited number of basic reactions appropriate for surrogate-making.

During recent history, to be sure, complex operations have been invented for making all these fundamental surrogates, which enable them to be conveniently reproduced, stored, and transmitted. Secondary surrogates are the result. The earliest technique of this sort, writing, is an instance of making a permanent surrogate to substitute for a simpler but temporary surrogate, i.e., tracings which are a substitute for speech. Writing probably evolved in the history of civilization from drawing, which is a primary surrogate (9). The main technologies for secondary or tertiary surrogates seem to be (a) printing, which substitutes for writing; (b) sound-recording and reproducing, which substitutes for speech and music; (c) photography, which substitutes for drawing, painting, engraving, and other methods of altering a surface by hand, and which, together with photo-engraving, has flooded our environment with pictures; (d) cinematography, which enables a picture to represent time as well as space; (e) vacuum-tube images, both pictorial (television) and symbolic (radar), the end of which is not yet in sight, and finally; (f) various techniques for replicating things in three dimensions and thereby making models, displays, exhibits, panoramas, and simulators intended to produce all kinds of "synthetic" realities.

It should be noted that there is a characteristic of primary surrogates which the secondary or tertiary surrogates tend to lack,

namely the personal style of the producer. Speech, gesture, handwriting, drawing and artistic style are notably "expressive" of the person who performs them (1). His reaction is specific, in other words, to himself or to his mood in addition to being specific to an object. The more complex products tend to lack this personal character. A painter is usually identifiable from his pictures but a photographer seldom is.

IV. The Consequences of Surrogate-Making for the Perceiver and the Producer

The most obvious consequence of surrogate-making is that another person can apprehend objects, places, and events perceived only by the first person. This makes possible a sort of vicarious experience for other individuals; the writer of a book, for instance, can produce mediated perceptions in many other people, and they may be people who live in distant places or even will not be living until future times. He can make them see what he has seen and hear what he has heard. A similar power is commanded by the painter, the movie maker, the teacher, and the parent. One person can, as we say figuratively, transmit knowledge to others. What is equally important, however, is the fact that the first person can *exchange* surrogates with other persons. This makes possible a common body of perceptions among the group; it influences their direct perceptions and it may lead to a sort of consensus of experience, a common world in which mediated percepts and direct percepts are no longer separate.

The making of a surrogate, we must remember, necessarily involves self-stimulation whether or not it ever stimulates anyone else. Stimulation is fed back into an organism synchronously with its action. A speaker hears his own voice; an actor feels his own gestures; an artist sees his own pencil-movements. As a result, the perceptual process and the surrogate-making process tend each to lead into the other, and the two become inextricably mixed. As Morris and others before him have pointed out (11), this circular response in children, in conjunction with the facts of social stimulation, eventually converts a vocal sound into a symbol. The symbol-process then comes to occur in the absence of another person and even in the absence of the stimulating object to which the original perception was specific. At this stage of development the individual "thinks." Since the same circular operation occurs for other surrogates as well as for vocal ones, it is not unreasonable

to suppose that a person can learn to think in terms of drawings or graphs or models (and of the manipulations which produce them) as well as in terms of words. It may even be possible to infer, later on in this essay, that in certain respects such thinking is more easily performed than is verbal thinking.

V. Conventional and Non-Conventional Surrogates

An attempt can now be made to formulate the difference between words and pictures. All surrogates are specific to their referents, but the correspondence between a word and its object is probably not the same as that between a picture and its object. Morris faced the same problem when he considered that a great many signs are, as he put it, "iconic" (11: p. 23 and 191). His formula is very simple: a sign is iconic to the extent that it has itself the properties of what it denotes, or to the extent that it is similar to what it denotes. An image or a portrait of a man has many (but not all) of the properties of the man himself.

This statement is illuminating but it does not go very far, as Morris might be the first to admit. What *kinds* of properties can a surrogate share with the thing it stands for? In what respects is it similar? Can a surrogate be wholly unlike its object? And what if the object be abstract, so that there is little to be denoted?

Consider two extreme cases of what can be meant by the correspondence of one thing to another, first the correspondence of a license-plate to an automobile and second the correspondence of a shadow to the tree that casts it. The plate is specific to the car because of an arbitrary pairing of the two and because of a rule of social conduct that says plates may not be exchanged or duplicated. The shadow is specific to the tree because it is a geometrical projection of the tree on the surface of the ground by rays of light from the sun.

By analogy with the license-plate and the shadow, one may suggest that surrogates at one extreme are specific to objects, places, and events by *convention*, while surrogates at the other extreme are specific to the same things by *projection*. Language and algebraic symbols tend to fall toward the former pole and pictures or motion pictures toward the latter. Diagrams and graphs fall somewhere in the middle. Considering a language as a set of sounds produced by vocal reactions (or an equivalent set of tracings produced by manual reactions) the obvious fact to consider is that some groups of men have one set while other groups

have different sets. A given object has different names in different languages. On the other hand the enormous number of photographic snapshots existing all over the world constitute a single set. A given object could be matched with its photograph by any human being without having to learn laboriously a special vocabulary of photographs. The object and its name have an extrinsic relation, whereas the object and its picture have an intrinsic relation.

Non-conventional, projective or replicative surrogates seem to be characterized by a very interesting possibility, which will require closer examination later. It is the theoretical possibility of the surrogate becoming more and more like the original until it is indistinguishable from it. For visual perception, and under certain viewing conditions, a model can be elaborated until the artificial scene is equivalent to the natural one. Under very special viewing conditions a motion picture can probably also be so elaborated that the perceiver is led to suppose that what he sees is an actual situation and an actual sequence of events. This possibility is *not* characteristic of a conventional surrogate.

Both conventional and non-conventional surrogates may, of course, be relatively unspecific to their referents, and to this extent the resulting perceptions will also be unspecific. Language may be vague or ambiguous (2: ch. 2) and so also may pictures. *In the case of pictures the relation will be called one of greater or lesser fidelity; in the case of words the relation will be called one of greater or lesser univocality.* Maximum fidelity of a picture or model will be defined later, in terms of geometry and optics. Maximum univocality is very difficult to define; the task will be left to the students of semantics and of information-theory.

A number of propositions about words and pictures seem to follow from the foregoing assumptions, of which four will be stated.

1. In general, children have to learn the correspondence of a surrogate to its object in order to make use of it. *The more nearly a surrogate is projective or replicative, the less does associative learning need to occur. The more nearly a surrogate is conventional, the more does associative learning need to occur.* Pictures and models are closer approximations to direct perception than words and symbols are.

2. Distinguishing between concrete objects, places, and events on the one hand, and abstract properties, qualities, or variables of them on the other, *the more nearly a surrogate is*

replicative or projective the less is it capable of referring to abstractions and the more must its referent be concrete. Conventional surrogates, however, do not have this limitation. *The more arbitrary a surrogate, the more is it free to specify anything, abstract or concrete.* Verbal responses, for example, may be either names which identify objects or adjectives and adverbs which specify their properties. Picture-making can also identify objects and specify properties, but it cannot name an object and describe it *separately*. Verbal surrogates enable us to separate abstractions from concrete things and respond to them in a special way. With symbolic responses we can make propositions and hence perform logical and mathematical thinking. A realistic picture on the contrary, cannot state a logical proposition.

3. If purely conventional surrogates exist at one extreme and purely replicative surrogates at the other, there are "mixed" surrogates which are intermediate. These are specific to their referents partly by virtue of univocality and partly by virtue of fidelity. This applies particularly to pictures made by hand, which will be called "chirographic." The shift in human pre-history from picture-making (such as cave paintings) to picture-writing (such as Chinese characters) is apparently a development away from fidelity toward univocality. The development of Western painting up until the advent of photography is partly a matter of striving for fidelity, but artists at all times have also sought to specify general or abstract features of the world. Cartoonists, for instance, do so. *Mixed surrogates, especially chirographic pictures, specify both concrete objects, places, and events and general or typical objects, places, and events.* In other words, graphic conventions or graphic symbols may be incorporated in a picture as distortions of line, shape, proportion, or color. This reduces fidelity, but it may increase univocality. The latter effect, however, depends on the *establishment* of the convention.

4. A conclusion seems to follow from the forgoing paragraph, which may be controversial. *A chirographic picture cannot at the same time possess high fidelity for something concrete and high univocality for something abstract.* The introduction of graphic symbolization into a picture necessarily sacrifices its capacity to represent. The effort to gain abstractness entails a loss in concreteness. The sacrificing of fidelity, that is to say distortion, should have the result of making the observer's perception vague and his behavior unspecific, *as a general rule.* Only when the distortion is such that artist and observer both accept it as a

univocal symbol is the sacrifice worth while. The artist's intention may have been to make evident some typical or significant feature of the original, but if his distortion is not established as specifying it, the observer is only puzzled. If his distortion *does* specify it, the picture can evoke not only a mediated perception of something concrete, but also an apprehension of its general, abstract, or universal features.

VI. The Fidelity of a Model

Certain types of surrogates, it was asserted, are characterized by fidelity (replicative or projective). Models and pictures are examples. Other types of surrogates are characterized by univocality, without fidelity. Words and symbols are examples. "Fidelity" must now be defined. It should be treated as a matter of degree, and the definition should be mathematical. The geometry of fidelity needs to come up for discussion. We will begin with models.

A faithful model can be defined as a physical object whose various surfaces have the same dimensions as the corresponding surfaces of the original object, and hence are geometrically congruent with them, but which is made of a different substance than the original. When the ratios of dimensions are the same, and the surfaces are geometrically similar instead of congruent, it is a *scale* model, and this is the commonest kind. Color can be reproduced as well as shape and structure. A model as thus defined will produce a retinal image identical with that of the original and, as an object, will be visually indistinguishable from the original. The *surroundings* of the original are not reproduced, however, and the ground on which the figure appears will then be different.

A model can be fabricated for a *place* as well as for an object in it, with the same definition as above. An example is a stage-setting, or the simulated cockpit of an airplane. A *working model* can be constructed in which movements and the course of events are replicated, although this begins to be difficult. Theoretically, this simulation of a total situation could be elaborated indefinitely, but if the purpose is a visual surrogate, it will soon become more economical to utilize a *picture* or a *motion picture* instead of a model if the observer's viewing position can be confined to one spot.

A model has several dimensions of fidelity: shape and proportion, motion, size, color, texture, and the like. Since a learner does not need to become familiar with *all* the properties of an absent

situation in order to learn how to deal with it, there is theoretically no need to simulate all its properties in a model. The properties which are relevant or significant for his future behavior are the important ones.

The most obvious kind of non-fidelity of a model is any distortion of shape. Consider, for instance, a set of scale-models of different military aircraft used for the purpose of learning to identify and name the originals. As a general rule, distortion on the models would lead to confusion and poor aircraft recognition. There is evidence to suggest, however, that a distortion which exaggerates some *unique* or *characteristic* feature of an airplane relative to all the others may lead to *improved* identification of it (4: ch. 7). The phenomenon may be related to the caricaturing of faces by drawing, and it is consistent with the fourth proposition of Section V. This prediction can be tested experimentally.

VII. The Fidelity and Scope of a Picture

The fidelity of a picture, like that of a model, has to be defined geometrically, and only as an extreme case. *A faithful picture is a delimited physical surface processed in such a way that it reflects (or transmits) a sheaf of light-rays to a given point which is the same as would be the sheaf of rays from the original to that point.* This definition is intended to apply to paintings, drawings, color prints, photographic prints, transparencies, projected slides, movies, television pictures, and the like, when taken as cases of pure representation. The definition is equivalent to saying that a picture may be considered as a geometrical projection, and that the relation of a picture to its original is given by a polar projection of a three-dimensional solid on a plane. If the center of projection is taken as infinitely distant from the solid, the polar projection becomes a parallel projection, and the picture correspondingly becomes a map, or a plan view, such as is employed in engineering drawing. This unique point for every picture is what makes the viewing position for a picture important, as will be later evident.

In the above definition a sheaf of rays is "the same as" another when the adjacent order of the points of color in the cross-section of one is the same as the adjacent order in the cross-section of the other. As the light-energy varies along any cross-sectional axis of one, so must it vary along the corresponding axis of the other. *To the extent that this condition is fulfilled, the picture will be said to have fidelity.*

All the above applies to a "still" picture, and the fidelity defined is momentary only. *If in addition to the same adjacent order of color points, there exists the same successive order of color instants the picture will be said to have temporal fidelity.* If the temporal pattern in the picture is that of the original, complex qualities like the motion, sequence, change, growth, and pace of the original can be reproduced. The motion picture and the television image are techniques for approximating this state of affairs. It should be noted that the points and instants referred to above do not have to be the theoretical points and instants of mathematics, but may be finite units of area and finite intervals of time. The unit areas of the half-tone photograph exemplify the former, and the 1/24 second intervals of the standard motion picture exemplify the latter.

Along with fidelity, another important property of a picture is its scope. A picture was defined as a *delimited* surface, which is to say a picture has edges, commonly rectangular. If the surface is flat, the sheaf of rays projected by it to the "given point" is necessarily less than 180° in solid angle, and usually much less. Some pictures, such as murals, intercept a wide angle; other pictures, such as portraits, intercept a narrow angle. *The scope of a picture is the angular sector of the original environment intercepted by it.* One picture, in other words, may be a surrogate for a wide piece of the absent scene and another may be a surrogate for only a narrow piece of the absent scene, or perhaps only for a single object in it. When an environment needs to be represented, or when the background of or relations between objects, people, or events is important, a picture of wide scope is called for. When only a single object, person, or event needs to be represented, a picture of narrow scope may be sufficient. The scope of a photographic picture, for instance, is the angular amount of light intercepted by the lens of the camera. Scope should not be confused with degree of enlargement of a photograph. It is determined wholly by the lens used. A picture taken with a telephoto lens has a narrow scope and one taken with a wide-angle lens has a wide scope no matter what the size of the print in either case may be. The scope of a picture may be reduced by masking or cropping it, but it cannot be increased by photographically enlarging it. Neither can it be increased by holding the picture close to the eye or coming toward it for a close look. The retinal image of the observer is thereby magnified but the scope of the picture remains unaltered.

The fact that a picture is a surface with a boundary means

that a picture can never, practically speaking, fill the entire field of view of its observer, which at any one moment occupies nearly a solid angular hemisphere. It is always surrounded by something else *not* the picture (the room for instance); it is a figure on a ground in psychological terminology. An effort to overcome this limitation can be made by increasing the scope of the picture and employing a *curved* instead of a flat surface. Panoramic still pictures have long existed, and semi-panoramic motion pictures are now being exploited. The psychological effect of this increased scope is very striking. Even a completely circular panorama, however, cannot surround the observer below his feet as well as to his right and left, since there has to be a physical floor to stand on. Only a full-scale model of a situation can do that.

VIII. Space in Pictures

A serious misunderstanding has existed for a long time about the physical fact that a picture is a two-dimensional surface. The misunderstanding takes the form of asserting that one cannot see three dimensions or depth in a picture. What one "sees" is a patchwork of flat surface-colors which serve as clues, and then one "infers" depth in the scene. This account of the matter is mixed up with a second more basic misunderstanding which assumes that the retinal image itself is a picture (this assumption being false) and then goes on to assert that we can only see flat sensations of color in the world around us and must infer its depth. There is at least a germ of truth in the first misunderstanding, for anyone who looks at a picture can see a flat surface, if he attends to it as such. (The second misunderstanding is less excusable, for very few people who look at the world can see a flat surface in front of their eyes.) If, however, the man who looks at a picture does *not* give special attention to the surface as such, he perceives a three-dimensional scene. How is it possible to assert that he can see a flat surface and can also see a three-dimensional scene?

The misunderstanding about pictures arises because it is only half of the fact to say that a picture is a two-dimensional surface. It is a surface *and it is also a peculiar sheaf of rays.* The sheaf of rays is an essential part of the total fact of a picture. The fact of physical optics (the sheaf) and the fact of physical chemistry (the processed surface) must be combined. The surface as such is flat, but the surface as the source of a sheaf of rays may be equivalent to that of the original scene, and the latter is not flat. The hypo-

thesis to be proposed is that a picture can ordinarily be perceived in two different ways, as a surface and as a three-dimensional scene, and that this is so because the sheaf of rays ordinarily contains within it elements which are specific to a flat surface and also elements which are specific to a three-dimensional scene.

There can be no doubt whatever that a picture is capable of yielding a perception of depth and distance. It is, no doubt, the kind of depth and distance obtained when we close one eye, but this is not so different from the kind obtained with two eyes as the traditional theory asserts. The supplementary stimulation for depth-perception obtained from the second eye is not, on the one hand, negligible, but neither is it, on the other hand, basic or essential for depth-perception (5: ch. 6; 4: ch. 9).

When, under very special circumstances, a picture *cannot* be seen as a flat surface—when an observer who compares a photograph with the original scene cannot say which is which—it is because the elements in the sheaf of rays which are specific to a surface have been carefully eliminated. This involves (a) arranging for the picture to be viewed through an aperture, and for the original scene to be viewed through a similar aperture; (b) making the physical texture of the surface very fine; and (c) processing the surface so that the ray-bundle has high fidelity. A good deal of informal evidence for the success of this experiment exists, but it needs to be systematically performed.

It should be noted that our definition of a faithful picture implies not only a surface and a sheaf of light rays, but a unique viewing point. A picture is unlike a model in that theoretically it should be viewed with a single eye placed at its center of projection and kept motionless. Actually, and in practice, people do not satisfy these conditions very well when they look at a picture. They use two eyes, move about, and look from positions farther or nearer, above or below, and to the right or left of the center of projection (although they do, at least, always keep the picture nearly upright). These circumstances make the sheaf of rays *at the retina* (actually a pair of them at two retinas) rather different from the ideal sheaf of the theoretical picture, and plenty of stimulation is thus ordinarily provided for seeing the picture as a delimited flat surface.

Several propositions can now be formulated about space perception relative to picture-perception.

1. Since two distinct systems of stimuli operate when a picture is viewed in the ordinary way, two kinds of perception

ought simultaneously to occur: first, that of a three-dimensional scene (the situation represented) and, second, that of a delimited flat surface which is part of a different scene (the room, say, in which the picture is shown). There is evidence for this proposition, and more should be obtained.

2. The mediated perception evoked by a picture is a space-perception, that is to say, it is three-dimensional. There is already evidence that the size of distant objects can be accurately judged in a photographic scene (4: ch. 9), or in other words, that size-constancy holds for this kind of perception. There is need for more evidence of this kind. We need to know whether accuracy of spatial judgments is increased when the fidelity of the photograph approaches a maximum, and also what happens to the perception when the fidelity is much reduced.

3. If two distinct spaces are capable of being seen when viewing a picture, two correspondingly different sets of spatial judgments should be obtainable from the observer. One set would consist of judgments of the distance from the eye to the picture. Another set would consist of judgments of the distance from the point of view of the picture to a specified object in the picture. Phenomenally, the first distance would be in the space of the room and the second would be in the space of the picture. These two spaces should prove to be incommensurable. A similar experiment might require judgments of the size of the picture in contrast with judgments of the size of an object represented in the picture.

IX. The Unique Viewing-Point for a Picture

Insofar as any picture is a geometrical projection, it must have a unique center of projection. Although this point lies in the air on a theoretical perpendicular to the plane of the picture, it is just as important for the picture as the deposits of pigment (or silver halide or dye) on its surface. In the case of a chirographic picture, constructed with some regard to the laws of perspective, it is the "station-point" for the "picture-plane" (13). In the case of a photographic picture it is at the perpendicular distance given by multiplying the focal length of the lens of the camera by the degree of enlargement of the picture (8). This is the point at which an eye must be stationed if the eye is to be stimulated by the same sheaf of light rays which was included in the angular scope of the picture. In other words the visual solid angle of the picture at the eye should equal the scope of the picture, or, in still other words,

the eye should be so stationed relative to the picture that it takes in the same light that the camera did when the picture was taken (or that the painter's eye did when he made the picture).

The point has already been made that this ideal viewing position is departed from rather widely in looking at paintings, snapshots, projected slides, movies, and especially television pictures. The question which naturally arises is *what happens to the phenomenal space of the picture when a departure is made from the unique viewing-point?*

Compare the sheaf of rays to the center of projection and the sheaf of rays to the eye, when these are not the same. The latter is *magnified* when the eye is nearer the picture. It is *diminished* when the eye is farther from the picture. (It is also *compressed horizontally* when the eye is to the right or left of the center of projection, and is *compressed vertically* when the eye is above or below the center of projection, but these deformations will not be considered at present.) We may now put this question: How is the three-dimensional object corresponding to a given sheaf of rays related to the three-dimensional object corresponding to a *magnified* (or diminished) but otherwise similar sheaf of rays? Would the latter object be simply *enlarged* (or reduced), or would it also be *deformed?* Geometrical analysis demonstrates that the object would have to be deformed as well as altered in size. The deformation consists in a relative shortening of its depth dimension in the case of magnification, and a relative elongation of its depth dimension in the case of diminishment. The implication is that depth in the space of a picture viewed from "too near" is shortened, whereas depth in the space of a picture viewed from "too far" is elongated. Whether this geometrical analysis will predict what happens to the *phenomenal* space of a picture is an empirical question which ought to be put to the test.

There is good evidence, obtained with groups of aviation cadets during the last war, that various types of abstract perceptual discrimination *not involving any discriminations of depth,* when tested by the projecting of motion pictures in a classroom, are not affected by the distance of the eyes from the screen, that is, by the angular magnitude of the picture (4: ch. 4). This fact seems to suggest that the importance of the unique viewing-point for a picture depends on the kind of perception the picture is intended to produce. Perhaps the chief consideration is whether the perception needs to be correct with respect to depth or distance.

The issues involved in picture-viewing are highly complex,

including as they do problems of spatial perception and perceptual constancy. The main puzzle for a general theory of perception can be put in this way: there is evidence to show that a retinal image which is magnified, diminished, or laterally compressed is in some respects equivalent to the unaltered image as a stimulus for perception. There is also evidence to show that a retinal image which undergoes such an elastic deformation is in other respects *not equivalent* as a stimulus for perception. What are the viewing-conditions under which the first statement holds and what are the conditions under which the second statement holds?

The perception of pictures viewed *obliquely*, i.e., at an angle to the surface, presents a similar set of problems regarding phenomenal distortion and phenomenal constancy. A method of investigating them has been described by the writer (4: 170 ff.).

X. The Approximation of Pictorial Perception to Direct Perception

References have already been made to the experiment of arranging that a picture and the original scene represented be viewed successively, under aperture conditions, and the possibility that the observer will be unable to distinguish one from the other. The picture most likely to yield success in this experiment is probably a large photographic color-transparency; if the original scene involved movement, it would have to be a motion picture. Indistinguishability from the original has long been attained with *models* of certain things, for example, wax flowers, and there seems to be no reason why it could not be realized in pictures.

The experiment is theoretically important since it constitutes a test of the validity of the definition of a picture with fidelity given in Section VII. It exemplifies the limiting case in which an object and the surrogate for it can have precisely the same effect on an organism, and in which the pictorial quality of a picture-perception vanishes. But its greatest importance, perhaps, is in demonstrating negatively the visual factors which, under ordinary viewing-conditions rather than aperture-conditions, make a picture seem what it is, namely, a surface, a substitute, or a mediating object (6). These factors constitute a second system of optical stimulation, we postulated, which makes possible two kinds of spatial impressions and two kinds of judgments for the observer.

It is possible to add "realism" to a still picture in various different ways besides the aperture-method described. The semi-panoramic picture, and the circular panoramic picture constitute

one way. The motion picture is another way. It is possible to combine these effects in semi-panoramic motion pictures, as Waller has done in the "Cinerama." The stereoscopic picture and the stereoscopic motion picture is still another way. Color, sound, "stereophonic sound," the "subjective camera" method of shooting motion pictures, and perhaps others, are all techniques for increasing realism. It is the writer's opinion, however, that there are basic discrepancies among these lines of effort, at least between the stereoscopic and the panoramic, which will make it impossible to use them simultaneously in one grand effort to achieve "complete realism."

The *graphic* method of constructing a surrogate for a situation is fundamentally different from the method of building a *model* for it, or a full-scale replica. The replica for a situation has a ground on which one can stand. Any graphic method (including photography, cinematography and stereophotography) presupposes the use of either a *room* or a *viewing-device,* and this limits the ultimate illusion of reality. A viewing-device eliminates the sight of one's nose, hands, body, and one's feet on the floor, which is an important component of direct visual perception. A panoramic picture includes this component but necessarily introduces some kind of a junction between the room one stands in and the picture itself. The dilemma might be expressed by saying that it is intrinsically impossible to get the ego of the observer completely into the space of the picture. There will probably always be some tendency to experience *two* spaces, one incompatible and incommensurable with the other.

XI. The Fidelity of Chirographic Pictures

Little has been said so far about hand-made pictures as distinguished from lens-made pictures. Hand-made or chirographic pictures include paintings, drawings, cartoons, caricatures, animated drawings, and a host of others. Their fidelity, as defined, is generally lower than that of photographic pictures, although this is not true of necessity. As early as the 17th Century, some paintings of still-life achieved a level of fidelity barely reached by modern color photography. The reason for chirographic lack of fidelity, perhaps, is this. A picture, like a model, has many dimensions of fidelity to the object, rather than a single dimension. The object has many visual properties, but the most important ones (for most human purposes) are the form, shape, and proportion of its edges and surfaces. These can be rendered by *outlines,* which are very

easy to trace on a surface by hand. If we assume that a perceiver does not need to be given *all* the properties of an absent object in order to know how to deal with it, but only those which are *relevant* or *significant*, it is a waste of effort to simulate them all. The photograph reproduces them all indifferently. The chirograph reproduces them selectively. It can be (and has been) argued by artists that such selective emphasis may clarify the observer's perception of the object in a way that no photograph can do. The truth of this assertion is a problem in perception and cognition for which there is no present solution, but at least the assertion is not unreasonable. The danger of low fidelity is vagueness or nonspecificity. When the artist either omits some dimensions of fidelity or departs from fidelity by distorting form, he takes the risk, but he may achieve a picture which clarifies and specifies instead.

XII. The Advantages and Disadvantages of Realism in Pictures

Why, one might ask, do picture-makers strive for increased realism or, more exactly, why does a certain class of them do so? Why do children like realistic toys? Why the appeal of photography? of the movies? of television? of color-movies? of stereoscopic color movies? Only an intuitive kind of answer can be given until a workable theory of surrogates is more fully developed, but it might be of this sort: that human beings have a need for first-hand experience; that an increasing proportion of experience comes at second-hand in the modern world; and that they therefore need the closest thing they can get to first-hand experience.

A realistic picture, notably a movie, makes the observer "forget himself," or "lose himself in the scene," or "takes him out of himself." So also, of course, does the reading of history, or a novel, or a book on how to do carpentry, but the realistic picture does so with less effort on the part of the observer. And there are good reasons for the greater simplicity and directness of this kind of perception, as we have seen. Pictures and models are better than words and symbols for learning about concrete things, tools, mechanisms, or organisms, about particular places, scenes, and environments, and about existing events, processes, and sequences. If this is what needs to be learned, the surrogates for them should be "realistic."

On the other hand, proponents of the spoken and written word have argued that this kind of learning makes no demands on the "imagination" of the learner. No one knows what the imagination is, precisely, but it does seem likely that men need to apprehend

abstract things and general rules, as well as to perceive concrete objects. Words and symbols (including graphic symbols and geometrical drawings) are essential for learning about properties, variables, groups, classes, and universals. Men can make propositions with symbols, and discover new ones by manipulating old ones. They can mutually exchange propositions, and formulate general laws. If this is what needs to be learned, the surrogates for them should be arbitrary and conventional. Both kinds of surrogates have their value.

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SOME OBSERVATIONS ON COMMUNICATIONS THEORY[1]

•DALLAS W. SMYTHE

Dallas W. Smythe's perceptive observations continue the series of articles on communication theory initiated in the last issue of this journal. He challenges the dependence of communication research on "scientism" and the "controlled experiment" and presents the case for the use of rigorous logic and observation as valid research "evidence." Dr. Smythe is a Research Professor in the Institute of Communications Research and Professor of Economics at the University of Illinois.

WHAT do we think we know about the effects of mass communications (motion pictures, radio, television, newspapers, magazines and books)? Research in a number of academic disciplines and in the business organizations of the United States has been increasingly directed towards this question in the past 20 years. Without attempting an over-all synthesis, this essay is addressed to the logic of research in the communications field, and to its value systems.

I.

Our common sense tells us that these agencies of mass communication have had enormous effects. It has been observed for several decades how the Hollywood motion pictures have affected the peoples of the world. It could never be forgotten how a Hitler and a Roosevelt obtained effects through the use of radio. The social revolutionary history of the past hundred years would testify to the effects of the pamphlet, the book, and the newspaper in facilitating the creation of certain kinds of public opinion. And in its short history to date, television has demonstrated in the United States its undoubted power to effect changes in people's behavior if only through changes in their use of time in looking at it.

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[1]This paper was written for publication in Italian in the Spring 1953 issue of *Lo Spettacolo.*

Yet withal, can social scientists parallel this common sense observation with the corresponding "laws" of communications? The answer must be: They can not. What, then, is the reason for this? What are the prospects for their doing so?

My thesis is a compound of a series of interrelated propositions: (a) that we are a long way from being able to codify the laws of communications; (b) that one of the reasons for this state of affairs is an immaturity in research methodology manifested in "scientism"; (c) that a mature situation in communications research would balance empiricism with a methodological "open-door" policy, welcoming, with the stature of "science," observation and logical rigor outside the controlled-experiment situation; (d) that in this field possibly more than most others the ethical value issues implicit in the normative aspects of communications research demand searching self-examination by scholars. If, in the course of a short paper, the proof offered for all of these related propositions seems scanty, then I must console myself that it may be worthwhile even to have stated and briefly elaborated the issues.

Our distance from being able to measure adequately the effects of communications may be illustrated in relation to the most substantial single empirical research work yet done in communications: *Experiments on Mass Communication,* by Hovland and others (4). This report on experiments in the training and indoctrination by film of the American soldiers in World War II shows that films were quite effective in imparting skills of the "nuts and bolts variety" but that for changing attitudes toward the war films produced very little change in the intended direction. For altering motivation the films showed practically no effect. While we have many suggestive clues which may shortly lead us to more sweeping generalizations than these, the Hovland report typifies the present state of affairs. Obviously our experimental approach has thus far yielded results which are by no means commensurate with the common-sense judgments as to the effects of communications, illustrations of which were given in the second paragraph.

Among the several contributing factors to this state of affairs, "scientism" is not least. The bulk of the research in the interdisciplinary field coming to be known as "communications research" has been in the hands of persons who more or less consciously adopt the stance of "scientism." By this I mean that they will accept as "knowledge" only what has been demonstrated through "controlled experiments"; and that their assumptions and

preconceptions are often inexplicit and seriously biasing.[2] One of the more serious of these preconceptions has been that there is a simple cause-and-effect relation between the content of the mass media and the behavior and attitudes of the audience.

While doubtless unintended by Hovland and his colleagues, their virtuosity in the use of controlled experimental methods has to some extent provided a model for a "scientistic" approach to later communications research. Thus an otherwise admirable survey of the literature of social science on communications effects performed by Joseph T. Klapper is marred by scientism (6). This survey was conducted to provide answers to certain policy-oriented questions posed by the director of the Public Library Inquiry, a Social Science Research Council project devoted to analyzing the position of the public library movement in the United States. One question posed for Mr. Klapper was whether a plethora of escapist entertainment is conducive to social apathy. Mr. Klapper finds some "evidence" to support the view that escapist material provides "relaxation," "compensation," and that it sometimes has a "boomerang" effect which is personally and socially harmful. But when he comes to the "safety valve for social tensions" hypothesis, he summarily denies that a social apathy effect of escapist entertainment has yet

> . . . been demonstrated by any direct evidence. Nor could any evidence be adduced except by the most prolonged and elaborate experiment or survey. In the absence of such evidence, then, the thesis remains a thesis,—a conjecture held in common by acute observers, but by no means an established fact. (6: III-12)

He admits the "probability that mass media tend to sanctify the status quo," but argues that this tendency is "the result of various forces rather than the product of escapist communication alone."

Perhaps the semantic stance in which the question was posed is responsible in part for the nature of the response. But this passage illustrates the crippling effect of an assumption that the only evidence worthy of credence must come from the laboratory blessed with statistical measures of variance. Neither in the social nor the physical sciences can the validity of information be tested by whether it is "an established fact" in the sense used by Klapper. This fallacy is the essence of scientism, and its exposure as a fallacy

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[2] A salutary experience in this connection is to re-read, Thorstein Veblen's essays on methodology, "Preconceptions of Economic Science," in *The Place of Science in Modern Civilization* (13).

hardly needs documentation.[3] For Mr. Klapper, moreover, multiple correlations of forces produce "evidence" in a "laboratory," but not outside. The evidence from the fields of history, sociology, political science and economics is ignored as being unfit for acceptance as "science." Here we have scientism serving to obscure.

Lest this illustration be thought too slender a basis for my conclusion, let us look to Klapper's answer to the question: How is persuasion with regard to important civic attitudes carried on with the greatest likelihood of success? Here, to be sure, Klapper does use evidence derived from observation of social institutions (8) to support the view that the monopoly propagandist operates under conditions of maximum likelihood of effect. But his naivete in methodology is evident in his apology for the fact that "the 'research' on this topic has included no controlled experiments. . . ." (6: IV-21) To accept institutional observations as *exceptions* to the scientific "rules" of evidence is methodologically on a par with rejecting them for the same reason; in both events their validity is unrecognized.

Mr. Klapper's study also provides us with an example of the unconscious or at least unacknowledged normative bias which often accompanies "scientism." In considering how the public libraries might use the monopoly propaganda characteristics of the mass media to promote the libraries' cultural objectives, he *himself* uncritically accepts the status quo as unchangeable:

> Because American mass media are controlled by commercial interests who are concerned with maintaining the status quo, monopoly propaganda in America *is and can be* directed only upon the reinforcement or activation of attitudes already almost universally sanctioned. [Emphasis added] (6: IV-38)

Had his theoretical stance been otherwise, obviously the question might have been answered in terms which regarded the mass media as communicating units the policies and organization of which change through time. Conceivably the public library movement might have found policy use for such an analysis which recognizes the nature of institutional change.

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[3] A recent affirmative statement on this fallacy by two psychologists might well put a quietus on it:
Philosophers, educators and scientists have perhaps written more truth and nonsense about "The Scientific Method" than about any other single subject of common concern. . . . The scientific method . . . is at some time or other all things to all scientists. There is no such thing as *the* scientific method. It is more accurate to speak of science as a kind of adaptive behavior resulting from the special assignment which a certain class of people set for themselves. The assignment for the scientist is to apply himself to a domain of events in order to achieve so much understanding of it that his control of it and the predictions he makes about it will occur with a minimum of surprise (i.e. "error") . . . . There can be no rules or presumptions that will be invariant from scientist to scientist; effective solution of this problem as of any other problem may be tried via manifold routes. (7:14-15)

There is hopeful evidence that this constrictive view is being broken through. Thus Paul F. Lazarsfeld in his foreword to the Klapper report verbalizes the common feeling of frustration with the limited knowledge now available on communications effects. He says:

> In some quarters, there is a feeling that if we only had more and better studies, the answers would be quickly forthcoming. But this isn't likely to be the case. The main difficulty probably lies in formulating the problem correctly. For the trouble started exactly when empirical research stepped in where once the social philosopher had reigned supreme. To the latter there was never any doubt that first the orator and then the newspaper and now television are social forces of great power. But when specific studies were made about the effect of educational radio programs or the influence of the library on the community, these facts could only rarely be demonstrated. It is possible, of course, that our measuring instruments are not yet fine enough. But most likely the difficulty is due to the nature of the effects themselves. (6: 1-2)

Moreover, recent studies have, as Franklin Fearing remarks, pointed the way out from the limitations set by the simple causal relationship preconception. Two studies in particular (2, 15) show that:

> The viewer and listener are dynamic participants in the situation. They react *on* the content presented rather than reacting to it. How they react is determined by many factors *only one of which is the content of the film itself*. This is not equivalent to saying that film and radio have no effects. Rather, it raises the much more complicated question of what effects under what conditions. (3: 139-140)

To follow the implications of this conclusion is to widen the methodological outlook. For now it becomes relevant to hypothesize concerning the needs of members of the audience, concerning the character structure of the members of the audience, towards the institutional setting in which the audience exists—indeed towards all that can be meant by the concept of the dynamics of the personalities of audience members.

The theoretically self-conscious researcher is now invited to frame studies both in and outside of the controlled-experiment situation. For example, one might take account of the evidence about personality dynamics as given to us in *The Authoritarian Personality* (1). These social scientists were studying the general population—not avowed fascists—and were concerned with the analysis of the deep-lying as well as the surface aspects of prejudice. Quite aside from providing the communications researcher with techniques of identifying various syndromes of prejudice,

they offer some suggestive conclusions. Rational arguments, they say, cannot be expected to have deep or lasting effects upon a phenomenon such as social discrimination which is essentially irrational. Appeals to sympathy for the plight of minority groups may do as much harm as good when directed to people one of whose deepest fears is that they might be identified with weakness or suffering. Urging closer association with members of minority groups will be futile in influencing people who are so built that they cannot experience relations with others. And establishing liking for minority groups is next to impossible for people who are really unable to like anyone, including themselves. Of some importance for us is their final conclusion that no lasting increase in people's capacity to see and be themselves can be expected from manipulative devices. In other words, they say, the devices of salesmanship won't work to make people less authoritarian.

Other examples could be provided but they would unduly extend the present paper. I cannot refrain from mentioning, however, the possibility that empirical studies might be framed which would test the hypotheses advanced by Harold A. Innis (5), that cultures exist in space and time; that media of communication confer monopolies or oligopolies on the knowledge which gives being to cultures.[4]

The main point to be made here is that the way may now be open for integration of the content of the social sciences as it bears on the process of communication. If this hope is justified then we may expect to find the "quantifiers" endeavoring to measure variables constructed on hypotheses previously not admitted to the laboratory situation. Also one might hope that the results of rigorous logic and observation pursued *outside* the laboratory might in this area acquire status as intellectually valid "evidence."

II

At this point I should like to sketch one "non-scientistic" approach to the social science of communications. The following remarks are intended to make a methodological point and a substantive one. The methodological point is that new and stimulating insights may be revealed by admitting institutional observations as evidence. The substantive thesis is that such an historical view as follows suggests that as our culture has developed it has built into itself increasing concentrations of authority and nowhere is this

[4]See especially his paper, "A Plea for Time," p. 61-91.

more evident than in our communications activities. The reader will observe that the substantive fruit of this methodological approach has normative implications which raises a final topic for consideration.

I would begin by reformulating the issue of the "effects of the mass media" in terms of the "effects of the kind of communications used before the mass media came into existence."[5] The kinds of services which we must look for in the pre-mass media era will be entertainment (principally), and information and orientation (interpretation of experience).

How did mankind get its entertainment, its information and its orientation before the electronic age? Before the age of the film? Before the age of the printing press? What functions were performed by these services as thus rendered?

We might begin with the Middle Ages. In that period, most of the entertainment in the form of fiction (stories, folk tales, etc.) which was available to children was what they heard from senior members of their own families. The children's unsophisticated reactions of alarm or pleasure at the tales they heard might encourage the story teller to soften or expand the story as it developed. As far as specialized entertainment services were concerned, adults depended on ballad singers, minstrels, jesters and groups of actors. From them they heard the folk tales, fairy tales, morality stories, and so forth which constituted the non-clerical forms of entertainment. The pageantry of church and community ceremonies also had its entertaining aspects. As Pellizzi (10) has pointed out the entertainment was primarily ritualistic in character.

News and other information was similarly transmitted through face-to-face communications in feudal Europe. The market place, the inn, provided the location. Travelers, merchants, seamen, soldiers, etc. transmitted news to the general public in this way, while for the nobility and clergy special couriers brought information in person.

For the bulk of the population which had no formal schooling available to it, the main source of orientation was conversation—conversation between parents and children, between children, between men at the bench or at the pump or tavern, between women at their washing. For the church-goer, for the member of a medieval guild, for the merchant, and for the noble, appropriate

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[5]In this portion of the present article I am profoundly indebted to David Riesman, author of *The Lonely Crowd* (11). Standing back of him in this respect are Max Weber and the historians, sociologists and economists who developed some of Weber's ideas.

institutional orientation was provided by religious, occupational or political organizations.

In looking back, we are struck with the extent to which the medieval man's communications in-take was *traditionally* directed. Custom, superstitious and irrational though it might be, ruled his individual life and conditioned the content of his communications. You might say that the medieval man internalized at his parents' side the traditions which he then used to direct his life.

Apart from its tradition-directed content, communications in the middle ages had one other very significant characteristic: they were face to face. There was ample opportunity for what today is called "feedback." (What the communicator receives back from his audience is feedback.) The listener registered pleasure, boredom, skepticism, excitement, blunt disbelief, or some other reaction to what he heard. The communicator—whether story-telling grandpa, the court jester, the newly-returned veteran of the Crusades, or the traveling troupe of actors—could *see* and *feel* and *hear* the emotional response of his audience. On the basis of this feedback, he could and usually would modify his content if necessary in order to achieve the desired effect on later renditions. From the listeners' viewpoint, this interplay permitted direct—even intimate—"controls" on the communicator. His performance was subject to immediate review. His responsibility was personal, direct, and unshiftable.

The personal nature of medieval communications had still another implication. The success of the communicator depended in large measure on his skill and his personality. He was an individual, not a corporation. His policy was made under his own hat, not in an air-conditioned Board room by Board members mostly unskilled in the art of communication. Under these conditions the style of delineation of the characters, the story-line, the news report, and the interpretation was free and fluid.

Our second snap-shot view of communications history begins with the age of the Reformation, the rise of national states in Western Europe, and of the Commercial Revolution in economic life. It ends during the 19th Century. This one covers about 500 years. It was the era of the growth of modern capitalism. It includes the period of the Industrial Revolution, and the pioneering growth of American life down to the disappearance of the frontier. Progress was in the air. The Church and the nobility remained powerful forces in the new national states for most of this period. And tradition and status still were influential, especially among rural and working folk.

A new character type—the inner-directed character—came into being with the rise of Protestantism. Protestantism supplied the religious justification for the rising business class. It held with Calvin and Luther that business was not necessarily a sinful affair. For the individual, Protestantism meant that his conscience was more important than it had been under the traditional Roman Catholic system of the Middle Ages. It was as if, as Riesman says, he had swallowed a gyroscope. His conscience, like a gyroscope, kept him on course. The course was one which avoided the pitfalls of sin and waste in pursuit of material success here on earth and salvation in the hereafter. This inner-directed character system was diffused through the business community and from it to the population at large with the aid of the printing press.

The entertainment function of communications in early modern times was carried on by the successors of the medieval entertainers on the stage and in community ceremonies of one kind or another. The medieval function of the parents as story-tellers to the children was continued, but the content of the stories shifted somewhat to introduce inner-directed themes. With the printing press came books, newspapers, and the predecessors of our magazines. Increasingly these media assumed the function of providing information and orientation. *Communications began to be mechanized, began to be a business.* To this extent communications lost their personal, face-to-face nature. Now if the story-teller's readers threw his book into the fireplace in disgust, he didn't know it. There was no direct feedback. The readers had lost their direct control over those who spoke to them through the medium of the printing press. The market came between communicator and reader. Moreover, with the market for publications came the alienation of the creative writers from the policy-making of the press. Editors began to make policy on the selection of books and information for their newspapers—in line with the business appraisal of the market. Writers became specialists in writing in contrast to the full-functioned creative story-tellers of medieval times. The style of entertainment in the inner-directed era was unique and appropriate to its *Weltanschauung.* One can almost take it as axiomatic that with a decrease in possible feedback there goes a proportionate decrease in the humanity of communications. I mean by humanity all of the kaleidoscopic diversity of human elements of strength and weakness, humor, pathos, spontaneity, candor, imagination and originality.

Though *direct* feedback was lost with the advent of commer-

cial publishing, the market did provide one partly compensatory indirect control to the readers. New talents could enter the market easily. If a new writer didn't like the best deal he could get from an established publisher, he could find his own printer and publish his own work. Or, he could even start his own printshop and do the whole thing himself. It was relatively easy and inexpensive.

Up to the latter fourth of the past century in the Western world there was predominantly face-to-face communication. An enlarged school system, the Chatauqua circuit, the orators so popular 100 years ago, the family fireside where stories were told and retold, the legitimate stage for big and small cities, the early chambers of commerce, the early labor unions—all of these were the principal means of communication as recently as 75 years ago.

Our third historical snapshot covers less time than either of the first two. It is the era beginning in the last quarter of the 19th century. In it the scope of the business operation of our entertainment rituals has widened to include virtually all attention given to drama and music through the agency of the mass media.

This era was ushered in when as a result of the developments in our technology, productive capacity "caught up" with the capacity of the bulk of the population to buy the fruits of their labor. From that time on our system was capable of producing more goods and services than could easily be sold at the producers' desired prices. This led to the rapid growth of advertising and other methods of manipulating the customer into buying things. The disappearance of the old-style small businessman and the predominance of large-scale business organization has shifted the center of gravity of our population into white collar jobs. Along with this shift has, of course, gone the increase in urbanization. This concentration of population in cities necessarily has increased the dependence people feel toward others.

Deference to the presumed value standards of others is at the root of the character structure which is growing to be typical of the marketing era. Such standards tend to displace the conscience and tradition as the guide. "Other-direction" is the essence of the appeals of advertising and salesmanship. The method of character operation here may be likened to the radar. It is as if the other-directed person had swallowed a radar in his childhood, by which he guides himself according to the real or fancied standards of his peer-groups, the latter usually scaled somewhat ethnocentrically. The agencies of mass communications both facilitate and themselves create these standards.

As the army of white collar employees has grown, business and government have mechanized their duties and rationalized their operations. As Mills (9) puts it, the "managerial demiurge" sets up an impersonal "system" which manipulates the population to the presumed advantage of the organizations, but without personalization of responsibility. For those who head the organizations, as for the remainder of the "other-directeds," virtue comes no longer to be its own reward; rather policies are justified in terms of their results in meeting group-determined objectives. Group loyalties are exalted above conscience and tradition.

The procedures involved in training for the new outlook on life and business become pervasive. Personality tends to replace skill as a requirement for hiring and promotion. What began as an attempt to prepare employees for successful business has been diffused as a way of life. As Mills says rather bitterly, there is a public relations aspect to private relations of all sorts, including even relations with oneself.

> Without common values and mutual trust, the cash nexus that links one man to another in transient contact has been made subtle in a dozen ways and made to bite deeper into all areas of life and relations. People are required by the salesman ethic and convention to pretend interest in others in order to manipulate them. In the course of time, and as this ethic spreads, it is got onto. Still it is conformed to as part of one's job and one's style of life, but now with a winking eye, for one knows that manipulation is inherent in every human contact. Men are estranged from one another as each secretly tries to make an instrument of the other, and in time a full circle is made: one makes an instrument of himself, and is estranged for it also. (9)

The mass media now supply entertainment which more than fills the quantitative void left by the displacement of the older rituals for entertainment. As far as information is concerned, radio and TV have completed the attenuation of face-to-face communication begun by newspapers, magazines and books. The role of the family in interpreting information has also shrunken. Children, no less than their parents now depend on radio, TV, and publications for direct orientation on public affairs. More subtly, the comic books, the pulps, the movies, plus radio and TV provide in fictional form the behavior patterns which imply orientation towards public—and private affairs.

What becomes of feedback from the audience to the communicator under these conditions? Direct feedback is shrunken to the small volume of fan mail. Indirectly a sort of feedback is supplied by pressures exerted for "codes" of ethics in the operation of the mass media. Being administered by the same groups to which they

apply, these codes are inherently weak and unenforceable except through the operation of conscience.

The economic open-endedness of the publishing industry which was a partial corrective for the loss of feedback until late in the 19th Century has now virtually disappeared as a characteristic of the mass media. The huge capital sums required to start a successful newspaper, TV station, or motion picture production effectively exclude fresh and experimental ventures to the point where their occasional appearance is regarded as a "curiosity." The banker's approval, necessary to the loans required for investment in the complex technical equipment of our day depends on offering something *safe*—that is *like* what the existing mass media already sell. Patent restrictions also bar easy entry. And in the radio and television fields, the shortage of spectrum space limits the numbers of stations. On the whole the possibility of effective feedback to the men who run our mass media is negligible today. They are in effect autonomous—irresponsible, except through their own consciences, to the viewer, reader, or listener.

The style of writing and production used in our mass media is in keeping with the ethical and aesthetic values of other-direction. Riesman, in *The Lonely Crowd,* finds stereotyping characteristic of our mass media. Invulnerable authority symbols appear as stereotypes in most entertainment offered the young. In our current entertainment the hero wins so quickly that it cannot help but seem effortless. In the process neither the hero nor the listener has time to experience internal moral conflict (as in the inner-directed story), nor the desirability on occasion of asserting his individual goals in the face of hostile authority (as in the tradition-directed story).

There is a stereotyped tightness of fit in portraying the physical externals of the characters on our mass media. Details of speech and costume are carefully filled in. Typecasting with faithful repetition of familiar mannerisms is essential in order that the picture, article or program may be distinguishable from their competitors. Exceptions to this style are most often to be found in book publishing, occasionally in magazines, rarely in the other media.

Still another aspect of stereotyping in the mass media comes from the assumption on the part of the advertisers that the fictitious mass audience wants more of the same sort of programs currently available. Thus we find slavish imitativeness in the multiplication of a few types of entertainment programs. This

fallacy parades under the label of "giving the public what it wants (as determined by Hooper-ratings, and the like)," and has even been glorified by the president of Columbia Broadcasting System as "cultural democracy." Obviously the public cannot vote for what it has never experienced.

If the forgoing analysis has any validity, the hypothetical conclusion might be drawn that as our social organization has become more tightly integrated on the basis of modern technology, authority has increasingly been built into it. To be tested is the further hypothesis that our mass media, through cutting off feedback, through dealing in stereotypes, through specializing in a manipulative view of humanity (both directly through advertising and indirectly through the plot structures and motivations portrayed in entertainment and other program material) are capable of molding us more and more into authoritarianism. Such a conclusion is translatable into terms of a general theory of communication—provided all parts of it are not required to be demonstrated in controlled experiments simultaneously and immediately. An adequate general theory has yet to be fully developed. Perhaps a beginning lies in a theoretical model currently being developed by my colleague, Professor Charles E. Osgood. This model, as yet unpublished, conceives of the communications field as consisting of communicating units (individuals and social institutions) simultaneously functioning in all stages of the communications process. These stages are regarded as the *receiving* of information, the *interpreting* of received information, and the *transmitting* of information to other units. Account has also to be taken of "noise" (in the sense employed by Shannon (12), and "feedback."

Having identified the normative aspects of both the "scientistic" approach and an alternative one, a final word is necessary concerning the ethical value issues involved in the *application* of communications research techniques. In the United States there have been numerous expressions of concern on this score. For example, one of the leading scholars in this field, Dr. Robert K. Merton says, "The technicians of mass opinion . . . cannot escape the moral issues which permeate propaganda as a means of social control . . . the pressure of immediate objective tends . . . to exact a price of the prevailing morality for it expresses a manipulative attitude toward men and society."[6] A foremost economist in North America, Dr. Harold A. Innis, is heard to say:

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[6]Quoted in Whyte, William H., *Is Anybody Listening?* (14:233).

> The political realization of democracy invariably encourages the hypnotist. The behavioristic and psychological tester have their way. In the words of one of them: "Great will be our good fortune if the lesson in human engineering which the war has taught us is carried over, directly and effectively, into our civil institutions and activities." (C. S. Yoakum) Such tactlessness and offense to our good sense is becoming a professional hazard to psychologists. (5: 90)

The quotations could be multiplied. Quite recently, Mr. William H. Whyte, Associate Editor of *Fortune* magazine, in his *Is Anybody Listening?* delivered a biting attack on the social scientists who apply the techniques and theories of "social engineering" under many labels. It may be argued whether such a sweeping indictment is justified. Perhaps on balance, Mr. Whyte's view may be well-taken, if the results of social science in the field of communications are to be judged solely on the basis of the use made of this material in the current scene. However, an excellent case may be made for separating the ethically self-conscious social scientists from those who practice pseudo-social science. My point here is no more and no less than to establish the proposition that a greater degree of concern with communications theory, its premises and its preconceptions, is the best safeguard communications social scientists can use to ensure the integrity of their scientific work. In the interest of the values of our cultural heritage this, it seems to me, is our ultimate obligation.

TV PRODUCTION: THE EASY WAY

•JOEL CHASEMAN

More and more frequently audio-visual educators are being expected to become proficient in the techniques of television production. However, practical advice from educational television practitioners is scarce. So Mr. Chaseman's discussion of television production techniques is welcome at this time, and it presents the knowledge of an experienced commercial television producer. Joel Chaseman is Director of Public Service and Publicity at WAAM Television, Baltimore, Maryland.

TV PRODUCTION is easy. It is easy the same way that writing is easy, or sculpture, or any creative mode of communication. It is easy for the right people. As in the other creative fields, communication from artist to audience is the target, and it matters little what means are used. In this article, we shall consider the basic idea—communication—rather than the frills and embroidery, the technical data and psychological mumbo-jumbo of the theorist.

The Question of Program "Level"

First, from experience, it is clear that there is no difference in TV production between the "commercial" and the "educational" or "public service" program. Both appear on the air and are available to the home audience. In fact, in an increasingly greater number of cities, one is in direct competition with the other for viewers. Since the commercial program presumably attempts to reach every family in the transmitting area of the station, the producer of the educational program has but one important decision to make—whether to attempt to appeal to all these viewers or to confine the appeal to a specific segment of the audience. In essence, this becomes a question of *level*. And, even here, there is some data which has been gathered empirically in support of the claim that the mass audience can be reached by means other than pandering to the 12-year level of cultural development. In "Your Hit Parade" no more

or less than in "The Johns Hopkins Science Review," the first order of business must be "what material are we attempting to present, and to what audience." All other considerations begin when this has been decided.

The Importance of Pace and Its Relation to Treatment

The first problems which face the producer of a television program, once content has been decided and general audience determined, are treatment and pacing. The overdrawn truism equating television and show business will not be used here. Television is, in truth, rarely show business. It is, for better or worse, more often radio with pictures. It remains true that a good "show" will capture an audience, and that a prime element of a good show is intelligent pacing. The classroom pace differs from the pace of a Minsky burlesque, but each has its audience. The producer must decide what pace should be set, and all his treatment should be consistent with that decision. Such seemingly independent factors as "dollying," "cutting," lighting, sets, and art work will all evolve from the pace set for a specific program. An illustration of a pacing fault all too common in local television stations is the elaborate opening worked out in detail by ambitious producers. With recorded symphony orchestras and special artwork, an opening can be planned which will dwarf most network productions—only to lead into a poorly lighted, skeleton-simple discussion program featuring two stumbling "experts." The letdown and consequent loss of audience stemming from this common contradiction in pacing is incalculable. On the other hand, if the producer, in dealing with this common problem, plans the program opening to be as unostentatious as the main body of the show, the letdown will not occur, and he will have a greater chance of holding his audience. Treatment will determine pace, and pace will determine setting, personalities, and vocabulary level. Both treatment and pacing will be determined by the considerations of content and audience.

Playing to the Specific Audience

It is a fact that something must be expected from the audience. While most of the burden lies with the producer, the audience must play more than a passive part if it is to gain anything more than a very sketchy appreciation of the program. It is the job of the producer to interest his audience in making the effort. The producer's job is to communicate content—so he should attempt to

make the audience want to absorb. If the audience is more attracted by the artifices of the trade than by the substance those artifices are meant to highlight, the producer has not done his job. As in a professional stage play, treatment should be little more than attractive packaging—to pinpoint meaning and emphasize content. In the stage play, pacing means a great deal. An Orson Welles production of "Native Son," with staccato scene changes, no intermissions, frenzied movement and byplay in the balcony and the aisles, recorded sound effects, and intense, rapid readings is consistent in effect and an accurate reflection of its content. Compare it, however, with the pace of "Member of the Wedding," a rambling, leisurely, entirely conventional play in which pace is nevertheless consistent with content and over-all aim. In each, every artifice contributes to the desired effect of the evening. Check "Omnibus" and "The Jackie Gleason Show." They are alike only in their first, fundamental approach—to establish a program which, within an implied framework, will be organic in its parts, each contributing to a unified whole.

To cite an example—

WAAM was asked during a recent political campaign to originate a series of programs in behalf of one candidate with a long public record as prosecutor. From the beginning it was decided that these programs should appeal to the mass adult audience of Maryland. The sponsor was interested only in registered voters of the State of Maryland. He decided that a highly dramatic treatment was desirable. The man himself is not a spell-binder, so the producers "wrote around him." For dramatic effect, the producers put great reliance on narrow, dramatic spotlighting of the actors, to the exclusion of all scenery but a "key prop" or two. Rather than depend on the doubtful talents of local actors, narration was used throughout the program to carry the story line, leaving only important incidents to be acted—and then only in five or six trenchant lines. Cutting from camera to camera was sharp and frequent, with little use made of slower dissolves and superimpositions. Taken as a whole, the dramatic, black-and-white harsh lighting, the documentary narrative, the austere settings, staccato editing, and use of startling, bigger-than-life closeups added up to a compelling and fast-moving program which achieved a very respectable audience rating. It was credited with tremendous contribution in the winning of nomination for the candidate concerned. Now, consider what might have happened if, as is so often the case, the candidate had been asked to sit at a desk and read his way through a prepared address detailing the virtues of his career! Here the initial twin decisions on pacing and treatment determined the effect. The details of that treatment in which pacing was primary hinged entirely on the fundamental idea of the series, while the content, of course, would have been the same regardless of approach.

Another example:

Gerald W. Johnson was approached by the author in May 1952 with the

suggestion that he become a television commentator. Mr. Johnson, in spite of a long and distinguished career as author and essayist, doubted that television was for him. He felt that he had something to say, but seemed more than a little worried that the visual medium might be the wrong place to say it. On the other hand, we at WAAM had a concept of the program that was to prove quite successful. We saw in Gerald Johnson a man of stature, whose words alone would be enough to sustain him in any public or private gathering. We felt no compulsion to "gimmick" the show. Mr. Johnson speaks slowly and with expression, both of voice and of feature. Because his writing is both careful and controversial, we agreed that he should read the full script. Now, according to the rules, what could be duller on television than a non-professional sitting and reading for fifteen minutes? Here's what Jack Gould of the *New York Times* said: "Mr. Johnson is one more example of how foolhardy it is to predict what will or will not be successful on TV. When he first comes on the screen he seems the virtual embodiment of everything wrong. His speaking voice is flat and practically bereft of inflection or modulation. He makes no bones about reading from a manuscript. But after a few minutes, Mr. Johnson captures one's attention. His style is that of the leisurely essayist, and his phraseology is often biting and pointed. . . . Mr. Johnson in short, is not afraid to speak his mind." What happened to the rules? We recognized that content here was most important, and that Mr. Johnson, as both author and speaker, was the only legitimate center of interest. The lighting was arranged to highlight his expressive features, and the setting arranged to be attractive but not distracting. The camera work adds to the total effect by using protracted inward dollies, arranged to arrive at a full closeup when a point is made in the script. Cutting is rare, and only at a transitional point in the script. The closeup, full-faced, is used often and functionally, to heighten effect at crucial textual points. Our camera "style" is analogous to "the leisurely essayist" and our cutting to closeups supplements "biting and pointed phraseology."

The two examples given buttress one principal point—the treatment of any show must be totally dependent on the desired effect on the audience, and the treatment, even of programs with like content, will vary as the target varies. And pacing—cuts, camera movements, and the actions of the talent—is the first and most important subdivision of this treatment.

Simplicity vs. Impact

Although a "how-to-do-it" article would not be proper here, there are many practical considerations which are germane. The producer of educational programs must exercise as much practical ingenuity as his counterpart in the commercial phase of the television business. There are many persons who read closely-spaced type filled pages in technical tomes because they are interested in the subject, but there are many more persons who might read the same articles if they were attractively presented. And even the

zealots would hardly complain if those same technical articles were set in modern type-faces and some little effort spent in makeup and illustration! This is as true in television. A marginal audience will watch instructional or cultural television programs regardless of treatment, but more viewers can be added if production is high quality.

How can we make the production high quality on a limited budget with limited technical resources and rehearsal time, with untrained personnel and "personalities" who have no television experience? The answer must be simplicity. Simplicity, in television, means using the material at hand and adapting treatment to fit. For the local producer to attempt "Adventure" with the resources of a one-horse school and the small town library is much like the high school drama society's attempt at "Othello." Both are commendable, but unrealistic; and both will fall very short of the over-ambitious goal. Simplicity should be the dominant characteristic of the program, whether or not the viewer realizes it.

Settings: Their Use and Misuse

There is no reason in the world why the local producer should spend his efforts having elaborate settings made when adroit use of cameras will obviate any need for them. The combination of lighting and lenses is entirely adequate, when used well. The viewer expects nothing specifically. He merely judges "good" or "bad" when he sees what is presented. If settings are deemed important, as they may often be, they must be television settings, not stage settings. The difference lies in the mobility and flexibility of the lens. On stage, the settings remain a fixed distance from the audience, and even the front row patrons see little detail. On television, a close-up lens may show every line and streak in a prop wall or bookcase or shelf. The producer should know which objects will be shown in detail and which will remain as background, in soft focus. He should so instruct the set artist, so that time will be taken only on those pieces requiring it. Sets should be planned for cameras, and only secondarily for actors. The limit of the proscenium and the wings does not exist on television, and vast horizons may be suggested by a clever "tabletop" effect or film clip. Studio space and lighting equipment are the determinants of set area and height, and a floor plan should be in the first order of production business. Settings are expensive and comparatively inflexible. Luckily, with some effort, the necessity for changes in setting can be written out of most first drafts. When the irre-

ducible minimum remains, it can be constructed so that it will be readily portable and inexpensive. Many stations have found a wooden-frame two or three-fold covered with unbleached muslin the most desirable set. The muslin can be painted and repainted, as required. It is light, and can be moved with ease. Constructed eight or ten feet high, with each fold three or four feet wide, this setting can be put in place quickly and easily. Its effectiveness, as with any more elaborate set, depends on the quality of artistry on the surface and the manner in which it is used. Avoid frilly, "busy" settings which in their detail and unimportant fripperies distract from the action. The producer should keep furniture and other "practical" props consistent with the background settings, and all should be of a piece with the treatment of the entire program. Anachronisms and inconsistent taste will be noticed.

Lighting

Lighting in television is perhaps the most important and most complex of the contributing visual arts. The comparative weakness of the camera "eye," the image orthicon tube, requires that the over-all lighting level be high, although some flexibility is possible. Anyone familiar with the use of an exposure meter for still photography knows that, while an entire scene may be too dark for effective pictures, some portion of that scene, if taken close, may be well-lighted. So it is in television. An over-all dark stage may not lend itself to a wide-angle shot, but a few square feet of that same stage may be brilliantly lighted and entirely suitable for dramatic closeup. Therefore, the lens selected by the director becomes the determining factor. What is lighted well for a long lens may be too dark for a wide-angle lens. The long lens covers less area at a given distance, and the light within that area, while adequate for the closeup thus obtained, may not be sufficient to light the entire stage for a wide-angle view. Early in television history, the controversy between exponents of fluorescent and incandescent lighting was widespread. Now, many studios use each and some mix the two. The question has resolved to the effect, not the technical means in reaching that effect. If any generalizations can be made on the subject, they would seem to be these:

1. Light the scene first for the image orthicon tube.
2. Establish highlights with "key" lighting as required by the format or script.

3. Think of scenery and lighting at the same time, and use lighting in support of the scenic plan.
4. Use pinpoint lighting effects if you must, but rehearse cameras, actors and stage crew so that everyone is in the right place at the right time.

Choosing the Cast

What about the actors? For some reason, television seems to expose the corrupt actor. Posturing and exaggeration show, as do lack of sincerity, glibness, unease, and superficiality. Assurance and poise are two very desirable traits in the television performer. A respect for the audience and some humility or friendliness help. In a teacher as in a comedian, projection of personality is important, and the tyrant cannot hide his tyranny for long before the image orthicon! I have no explanation for this phenomenon, but I know it happens. The greatest asset a television personality can have is a genuine smile, and the greatest liability can be fumbling insecurity. Otherwise, the long-established rules governing public performance hold true here, and need no elaboration from me.

Choosing the *right* personality may, however, be a problem. Normally, in any projected program, the personality role may seem "right" for any one of a number of applicants or possibilities. Here we should learn from the commercial sponsors. Since we are attempting communication, the personality for the program should be one who will, in his role, be believable. He should be a person who can project his part to the viewer and thus ensure the communication of content. This does not necessarily mean that he should be the one who knows most about the subject! I am not suggesting that the "glamour boys" of commercial television be employed, but it does seem important that the personality have attributes other than familiarity with the subject. In educational programing, we have found that the *popular* professors make the best masters of ceremonies or demonstrators, but that the extroverts do better with this medium than the introverted research men. This may seem obvious, but when the choice actually is being made it becomes difficult to select the second best man merely for his spark or wit. Do it anyway, for the minutiae will not be important to a television program, and even the second or third man knows the subject so well that, without the help of wit, he could leave his uninstructed home audience well behind him.

One further word seems to be in order here. In any community there are people who are not in show business and would be suc-

cessful in no phase of show business, but might be "naturals" for television. Gerald W. Johnson is one of many we have found in Baltimore. In Bloomington, Indiana, the television entrepreneurs have made an excellent thing of local citizens, and the same holds true in other comparable communities where the station people have had the nerve to use untried people on the air. If, in your city, you can find a science teacher who holds his class enthralled with unusual demonstrations, I submit that you have an excellent possibility for a regular television program. Cab drivers, janitors, housewives, university presidents—anyone with a wide circle of friends and admirers may be the *right* personality on television. Although the "intimacy" aspect of this medium has been somewhat overdrawn, the fact remains that here a mild but engaging personality can succeed in attracting followers as in no other medium. You must avoid the charlatan, and you must coach the amateur in a few of the tricks, but, by and large, finding a personality for identification with the programs should not be difficult.

Putting the Program Together

In the television program, as in any dramatic presentation, rehearsal is important. The complexity of the television process—which combines the problems of all the arts and a few unique in this field alone—means many kinds of rehearsal are necessary. The lighting must be rehearsed, the set and costume changes, the movement of actors and the delivery of lines, plus the camera movement, lens changes, and manipulation of visual effects. In many cases, it is most practical to rehearse each of these elements simultaneously, where possible. In other words, instead of attempting a rehearsal of the entire program, "from the top," it will probably be easier on everyone to rehearse each crew individually before bringing all elements together for a complete co-ordinated runthrough. In any event, camera rehearsal is expensive and separate advance rehearsal of the other units will cut camera time considerably. Personnel movement can be charted and rehearsed well in advance by marking on rehearsal room floor the set areas and camera positions. Lighting changes can be dealt with without using the actual actors or props. In all these cases, experience will gradually be gained, and the amount of time spent in careful rehearsal of each element will diminish as past lessons are drawn on.

Responsibilities of the Director

We come now to that most important of men—the director. In many cases, the director will also produce the program. The duties differ in that the producer is responsible for every detail of the program, while the director nominally oversees only the movement of cameras and the presentation of the show "on the air." The director is normally given a program complete with cast, settings, and so forth, all of which has been selected by the producer, with or without consultation. The director's job is to mold the elements he has been given into a program. Here, we shall consider only his approach to the program's visual presentation. Presumably, the director has been told the target of the program, in terms of content and audience. He understands what pace is to be used, and he selects his camera shots and angles consistent with those decisions. Consider, as he does, the enormous number of possibilities open to a director with the simplest of programs—the one man "talk" program. Assume he has two cameras, two slide projectors, two easels for opaque pieces of artwork, and a wall or two in the set. On those two cameras there are a total of six or eight lenses. If the cameras are mounted on a standard pedestal, there is an infinite number of positions, vertically and horizontally, from which he can shoot—and he can shoot from a moving position or a fixed position. The camera can "pan" or "tilt." It can move in on the subject or away from it, or at an angle to it. He can do the entire program with one lens on one camera or "cut" rapidly from camera to camera, changing lenses all the while. He can use artwork to illustrate a point, or he can use a three-dimensional model, or he can "superimpose" words on the screen to clarify spelling or derivation. And these are but a few of the choices open to a director on the simplest of all television programs. It follows that there must be certain guides to selection, or all directors would be gray and/or ulcer ridden.

Effects and Their Use

Most directors realize that camera coverage cannot be important in itself. Like every other element in the program, it must serve to aid the process of communication of content to the audience. Therefore, for the most part, the more complicated bits of trickery—the involved super-imposition, the electronic and mechanical "effects" which can invert or distort the picture in innumerable ways—are avoided unless they are functionally important.

Normally, these effects, which every young director overuses at first, distract. They do not add. Effects interesting in themselves usually subtract from the total impression of content. The best guide to the director seems to be the imagined substitution of the viewer for the camera. After all, the viewer at home is at the director's mercy. He sees what the director wants him to see. The camera tubes are his eyes. For this reason, the director is safest when he avoids rapid cutting from one camera position to another. He is most effective when clear picture follows clear picture—when none is jumbled with unnecessary detail or movement. He is least effective when he tries to do too much with one shot—dollying in on a moving object while superimposing a title, for instance. If a program is organic in its construction and logical in its sequence, it is equally logical to assume that confusion at one step breeds further confusion, and that the logical end result of such a chain is, at best, indifference to the entire effort.

Building a "Logical" Show: Shock and Repetition

All this is not to say that the director must be a plodding, simple soul so concerned with clarity that he ignores dramatic effect or unusual ideas which can contribute to his theme. The camera shots must, however, have logical sequence in building a dramatic effect. A series of closeup shots, one after the other, is not so effective as a sharp cut to a magnificently lighted closeup after a sequence of ordinary, but necessary, pictures which prepare the viewer for the shock. One carefully planned optical trick which makes a point or supplements the script is worth dozens of the same which become routine by repetition. The obvious point is one of good taste, not so much from the standpoint of esthetics, but from the immensely practical view that impact is heightened by shock, and shock, like a good right cross, should not be "telegraphed" ahead.

Repetition must also play a part in any instructional program. In television, no less than in the plays of Shakespeare, the most important points must be repeated. Lynn Poole, producer and originator of *The Johns Hopkins Science Review*, has contributed some excellent thinking to this aspect of developing the content of his programs. On many of his programs, a basic idea will be explained, demonstrated, and recalled. The explanation may be done with charts or other nonanimate visual material, the demonstration by the scientist concerned, and the film recalling the fundamental may be narrated—but the viewer has been told

what he is about to see, what he is seeing, and what he has seen. All of it has been visual, and all of it comparatively painless, for nowhere has Mr. Poole mentioned that he finds it necessary to implant a single idea three times in the fertile minds of his high-level audience. Incidentally, that may be a good point to keep in mind. Reveal to the audience as little as possible of your tricks and theories of production and format. In this respect, at least, you should follow the tenets of show business and leave backstage devices backstage.

In summary, it must be said that no single element of any program is as important as the initial thought which determines content and treatment; that each element must be selected and used in consonance with the fundamental pacing selected as the primary consideration of treatment; that director and producer must understand that each element is important in itself, but no element can be allowed to overshadow the show. By seeing the television program as a unit, much confusion can be eliminated and by understanding the relative position of the contributing arts, much impact can be gained. Television production will be easy for those who understand this new and versatile means of communicating ideas and are willing to subvert the means to the end, meanwhile keeping careful check on all details so they fit into the unit without attracting attention to themselves.

PREDICTING FILM LEARNING BY PRE-RELEASE TESTING[1]

•JOHN V. ZUCKERMAN

For the educational film producer, the prediction (prior to its production) of how well a film will fulfill its teaching objectives is an important consideration. John V. Zuckerman presents one solution to the problem—the pre-testing of the film by means of an inexpensive filmstrip of the story-board treatment.

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Increasing the effectiveness of teaching films. An important problem with which educational motion-picture producers and sponsoring organizations are concerned during various stages of scriptwriting and production is: What changes might be made in the treatment of the film to increase its effectiveness? The soundness of decisions regarding seemingly necessary script revisions could obviously be increased if better information were available concerning the effects that any proposed treatment would have when presented on the screen.[2]

Predicting the effects of a film. Motion-picture producers and research workers have used several methods of evaluating film treatments before final completion and release of films. These have included having judges read scripts and criticize story-boards,[3]

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[1]This study was completed while the author was a member of the Audio-Visual Research Division, Human Resources Research Laboratories, Department of the Air Force, Bolling Air Force Base, Washington, D. C. Clearance for publication has been granted by the Department of the Air Force; however, conclusions are the author's own and do not represent views of the Air Force. Acknowledgment is made for the helpful advice and criticism of Dr. A. A. Lumsdaine, Chief, Audio-Visual Research Division, HRRL, at the time the study was carried out.

[2]Throughout, the terms "effects" or "effectiveness" refer to gains in knowledge and skill, which represent tangible educational outcomes of film instruction.

[3]A story-board is usually a series of sketches intended to represent the most important visual aspects of the scenes to be photographed, with the dialogue or narration indicated below each sketch.

and observing the responses of audiences to "rough-cut" films. No experimental evidence has been adduced, however, concerning the validity of these methods. The study reported here represents an attempt to use experimental methods to assess the extent to which a filmstrip made from story-board art work can serve as a device for predicting how much people would learn from a completed factual motion picture.

Story-boards. Preparation of a story-board is a standard step in the production of most motion pictures, including instructional films. The story-board is usually modified as ideas about the film change; and when the actual production is to begin, the shooting script is made up from the revised story-board.

Story-board sketches are often prepared in enough detail so that they convey a good impression of the way each scene in the completed film will look. Thus a filmstrip made from story-board art work could bear sufficient resemblance to the final film to communicate to an audience a considerable amount of the information to be expected from the film, when accompanied by recorded sound.

The amount of functional resemblance that such a filmstrip bears to a completed film could be measured in terms of the correct responses of members of an audience to test questions before and after the showing of the filmstrip, compared with those members of a comparable audience before and after the showing of the finished film.

Plan of Investigation

Experimental materials. An evaluation study of the training effectiveness of an Air Force motion picture "Flight Capabilities of the F86A" was made by the Human Resources Research Laboratories (HRRL) in 1951. In order to conduct preliminary testing to prepare for the evaluation of the completed film, a black and white filmstrip of 262 frames was prepared by artists at HRRL. Working from a black and white still photograph of the story-board (originally in color), the artists redrew the story-board sketches in a size suitable for filming with an animation camera. The drawings were then photographed on 16mm film.

A narrator read the script, which was recorded on 16-inch discs. This filmstrip, with narration, was used in March 1951 in preliminary tests to try out questionnaires prepared for measuring effects of the film in the main evaluation study. The filmstrip contained frames for all scenes which were later included in the final motion picture.

Experimental procedure. The availability of the filmstrip suggested that an experiment to investigate the predictive value of the filmstrip could be carried out at the same time the finished film was studied. This involved measuring knowledge of facts covered in the filmscript before and after showing films to two comparable audiences. One audience would see the black and white filmstrip (accompanied by the sound track of the film); the other audience would see the completed color motion picture. Comparison of the effects of the two film media would then be made by evaluating the resemblance of responses made by both groups to the same test questions.

Population and experimental sample. Since the film was to be used to familiarize jet pilots with the speed limitations and load limits of the F86A, it was decided to use as subjects for the experiment students in advanced single engine flying school who were in training as jet pilots. The men were to be assigned at random to the two audiences, for film and filmstrip, to help ensure that variation in scores after the showings would give a valid indication of differences in the effectiveness of the film and filmstrip.

Procedure

Film materials. The manner in which the filmstrip was originally prepared has already been described. For the experiment it was to be shown with the accompaniment provided by the film sound track, which had sound effects and music in addition to narration. The motion picture used was the acceptance print of "Flight Capabilities of the F86A."

Preparation of the measuring instrument. The factual points covered in the final version of the script for "Flight Capabilities" were analyzed. Certain points which were repeated in the film were termed "key" points; others, not repeated, were called "subsidiary" points. Brief answer questions were prepared for a number of these. The questions were given some qualitative "pretesting" by asking several pilots to answer them and by having an F86A expert check them for ambiguity and intelligibility. A squadron of F86A pilots was shown the filmstrip and heard the narration from a disc recording. They were tested with 36 of the items before and after the showings. On the basis of quantitative information concerning item difficulty and response distribution the test items were refined and tests containing eight true-false and 28 multiple-choice items prepared.

Final versions of the tests were prepared as follows: In order to minimize prefilm boredom, particularly for student pilots who would have had no opportunity to learn specific facts about the F86A, the 36 questions were divided, at random, into four equal sets. Each before-test contained seven multiple-choice and two true-false items. Questions about pilots' rank, nationality, experience in all types of aircraft, and amount of reading on jet flying, as well as some concerning opinions about the difficulty of jet flying and the relative merits of different jet fighters were included.

Subjects. The study was conducted at Williams Air Force Base, where a number of student pilots of the USAF and NATO nations were in advanced single-engine pilot training (jet). These men were divided into several classes, which were at different stages of training: Class 51-C was in final jet training, with students averaging around 50 hours of F80 pilot time, Class 51-D had less jet time, and Class 51-E had just been introduced to the T33 and F80.

The flight-training schedule in use at the time of the experiment made it impossible to assign all of the available men to different test sessions completely at random. However, within the restriction that Class 51-E, Class 51-C, and Class 51-D were available for afternoon sessions on April 24, 1951, the day when the experiment was performed, the men were assigned to different experimental sessions by use of a table of random numbers. Altogether, six sessions were conducted on April 23 and 24. Only two sessions, one for the film and one for the filmstrip, are considered in this report, since these were the only two sessions in which the assignment of men to the two treatments was strictly random. A Chi-square test indicated no significant deviations in assignment of subjects of different classes to the two treatments. There is reason to believe that the subjects who saw the filmstrip were highly comparable, in amounts of jet flying experience, with those who saw the film. Only American pilots were used in the experiment, so there were no nationality differences.

Testing. The two groups of men were seated at the same time in comparable classrooms, where they had often been shown training films. They were informed of the nature of the film to be shown and told their reaction to the film was being asked. The men in the film and filmstrip groups were given identical instructions. Then "before-test" blanks were passed to the pilots. They answered a number of questions on their opinions about jet airplanes, and then the nine factual questions on the material in the

film. Then, in one room, the pilots saw "Flight Capabilities of the F86A" in color, with narrated commentary, sound effects, and background music. In the other classroom, the black and white filmstrip was shown, accompanied by the sound track of the completed film. After the showings, the subjects filled out the "after-tests," consisting of 36 factual test items, plus other opinion questions. The entire session occupied about one hour and 45 minutes.

Treatment of the data. The responses to questions were scored and transferred to IBM cards and percentages of correct answers were derived for use in a report on the film evaluation. During the preparation of this report, it was decided to discard the eight true-false items and to base the analysis on only the more reliable multiple-choice items. However, since two of the latter were also discarded because of wording defects, the analysis was based on the results for 26 multiple-choice items.

For comparing the learning from the film and filmstrip, it was also decided to use only the results for the 26 multiple-choice items.[4] The basic data which were used, therefore, were percentage passing scores for 26 items for individuals in the film and filmstrip groups before and after seeing the film material. The "before-scores" were based on sample sizes only one-fourth those for the "after-scores."

To evaluate the degree to which the filmstrip predicts the learning obtained from the film, Pearson product-moment correlation coefficients were computed between the pairs of item percentages for the two treatments. Several types of measures were used: (a) after-scores, (b) absolute-gain scores (after-minus-before percentages), (c) adjusted absolute-gain scores (after-minus-before differences), with the "before" base stabilized by lumping the before-test scores for both film and filmstrip group and basing the gains on the combined before percentages, and (d) adjusted "relative-gain" scores (obtained by dividing the difference between after-scores and combined before-values by the maximum change possible).[5]

Results. Table I lists the percentages of correct answers to

[4]Substantially the same pattern of results was obtained, however, when data for the discarded items were examined.

[5]Relative-gain scores take account of the fact that there was more room for the improvement on some items than others because of differences in before-level of correct responses. Positive differences in after-minus-before percentages were divided by 100 percent minus the before value to express the gains as a ratio of absolute gain to maximum possible gain. The few negative differences were expressed as a ratio of maximum room for negative change by dividing the after-minus-before differences by the before value.

each question for the two groups of 45 men before and after the film and the difference (gain) from before to after.

TABLE I—PERCENTAGES OF CORRECT RESPONSES TO QUESTIONS BEFORE AND AFTER SHOWING A MOTION PICTURE AND A FILM STRIP MOCKED-UP TO RESEMBLE THE MOTION PICTURE

Question No.*	Motion Picture Group**			Filmstrip Group**		
	Before	*After*	*Gain*	*Before*	*After*	*Gain*
1	53	73	19	58	58	0
2	23	73	50	8	60	52
3	15	47	32	15	42	27
4	31	82	51	8	69	61
5	27	98	71	8	93	85
6	9	91	82	20	78	58
7	18	80	62	10	62	52
8	64	78	14	58	71	13
9	10	49	39	10	47	37
10	10	36	26	0	40	40
11	46	58	12	62	47	−15
12	40	96	56	30	91	61
13	20	78	58	10	71	61
14	54	31	−23	42	42	0
15	54	42	−12	75	64	−11
16	15	98	83	15	91	76
17	69	58	−11	85	64	−21
18	10	78	68	50	49	− 1
19	36	62	26	42	71	29
20	18	87	69	20	87	67
21	20	89	69	30	76	16
22	82	53	−29	67	69	2
23	60	59	29	50	73	23
24	27	80	53	60	78	18
25	54	84	30	30	89	59
26	73	69	− 4	50	78	28

*These questions were multiple-choice items concerning factual information in the film "Flight Capabilities of the F86A." See text.

**Two groups of 45 student jet pilots saw the film. See text.

The correlations for different measures, presented in Table II, are well above the chance level of significance.

TABLE II—CORRELATIONS BETWEEN PAIRS OF MEASURES FOR TEST ITEMS IN FILM-FILMSTRIP COMPARISON

*Type of Measure**	*Correlation***
After Scores	.80
Absolute Gain	.71
Adjusted Absolute Gain	.94
Adjusted Relative Gain	.89

*See text for definitions.

**Pearson product-moment correlations between pairs of mean scores on 26 test items shown in Table I.

The several "gain" scores and after-test score levels for the film group have relatively the same "profiles" as for the filmstrip group. Regardless of which measure is used, the varying levels of knowledge obtained from the films are thus predicted by the levels of knowledge obtained from the filmstrip. This prediction is, of course, for over-all comparative levels from *item to item,* rather than for mean absolute gains or over-all after-score levels. That is, those items which apparently were successfully conveyed by the film were also apparently quite successfully conveyed by the filmstrip, and vice versa.

Conclusions

It is concluded that, for subject matter of the nature tested and with the kind of film treatment given to "Flight Capabilities of the F86A," a preproduction filmstrip based on the story-board for the film was capable of predicting the relative effectiveness of the final motion picture. Although on the average the motion-picture group showed higher scores for the test items used after the film showing than did the filmstrip group, the important result is that the item-by-item results were well enough correlated to yield a useful prediction of the differential effectiveness of the film in conveying different specific points of information. However, it should be emphasized that the film used in the study cannot be demonstrated to be representative of a defined universe of films, either in content or technique of presentation; thus the generality of the findings remains as a problem for further investigation. In order to permit useful generalization, the experiment should be replicated with a number of other, different kinds of films, and other kinds of film audiences.

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WORLD COMMUNICATIONS

• ANDRIES DEINUM

MORE RECENT FOREIGN BOOKS ON FILM

AGEL, HENRI, ET AL. *Sept Ans de Cinéma Français.* Paris Editions du Crf, 1953. 149 p.

A symposium by several of France's main film critics on the subject of the French film from the liberation until 1951. It is a fond but critical look backward in the form of a series of remarkably fine and perceptive essays. Doniol-Valcroze contributes a thought-provoking, fresh definition of the *avant-garde*, extending (and limiting) the meaning of this word in a long-overdue, useful manner. Denis Marion makes an intriguing distinction between "black" and "grey" realism, while Tallenay asks whether French film-makers have a sense of humor. Tallenay also discusses the films of ideas such as *God Needs Man* and *Life Begins Tomorrow*. Bazin writes about the filmed theatre of Pagnol, Cocteau and others, and Agel deals with the films adapted from literary works. The final piece by Quéval, properly titled, "The French Film is Mortal," outlines the precarious economic and social position of the French film industry. The book includes a complete list, with credits, of all French features released from 1945 until November 1951.

AYFRE, AMEDEE. *Dieu au Cinéma: Problèmes Esthétiques du Film Religieux.* Presses Universitaires de France, 1953. 210 p.

This is the first of several books in this present column dealing with the film and religion. There appears to be a sudden concern among religious organizations with the implications of film, an awareness that wholesale disparagement answers no questions, while a serious study might. Ayfre's fundamental work, however, is not directly sponsored by any faith—as are all the others to be mentioned. It was born within the Sorbonne's Institute of Filmology and its author is a teacher at the Catholic Seminary of Saint-Sulpice. The book's main emphasis is on the philosophy, which is the esthetics of the religious film. The author's aim is to grasp, and to isolate the chief means of evocation of the world of religion used by film since its inception. The kind of questions asked are: Is there a hidden common denominator between a de Mille religious epic, and say, Robert Bresson's sensitive *Le Journal d'un Curé de Campagne?* Or is there a relationship between Hollywood's sportive nuns of *The Bells of St. Mary's* and their tragic French sisters of *Les Anges du Péché*, between the ministers of *How Green Was My Valley* and *La Sym-*

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phonie Pastorale? The book probes the problem in all its aspects: (a) its history, (b) the religious values projected, (c) the types of religious characters involved, and (d) the psychology and the phenomenology of the subject. This scholarly study is likely to set the standard in its field for quite a while to come.

BEGONA, FRAY MAURICIO DE. *Elementos de Filmologia: Teoria del Cine.* Madrid: Morata, 1953. 407 p.

This fat tome is an imposing part of the general Roman Catholic offense in the field of film. While other faiths have come to grips with film, none of them have attacked the problems as thoroughly as the Catholics of several nationalities. Father de Begoña occupies the chair of filmology at the *Instituto de Investigaciones y Experiencias Cinematograficas* in Madrid. This book mainly represents a summing-up—a paraphrase of a multitude of theories about various aspects of film. It discusses everything, but everything: from the most obtuse philosophical considerations involving Lucretius, Ortega y Gasset, and Coventry Patmore to the most obvious technical descriptions of the functions of the several members of a film-crew. The unwieldy, uncritical bibliography has many inexplicable omissions, but also contains references to a great number of books about film not listed elsewhere.

BERTINA, B. J. *Film in Opspraak.* Nijmegen-Antwerp: De Koepel, 1951. 216 p.

A very sensible, refreshing book by a Dutch Catholic layman, possessing a wide knowledge of film, excellent taste, and sound critical judgment. The book is meant as an introduction to those seriously interested in film from a Catholic point of view. It takes the form of a historical survey, interspersed with esthetic, social and ethical considerations, and frequent analyses of films in depth. It is a reasoned apology of film, ably exploding rooted misconceptions of the medium and its effects, drawing on some of the latest European research. Rather surprisingly, Bertina attacks Hollywood's "false feeling of reality" as evidenced in its Catholic films such as *Going My Way* and others. He feels the distortions of this type of film have done a disservice to the cause of Catholicism. All in all, a most stimulating book written with a profound love for film.

CHIARINI, L., and BARBARO, U., editors. *L'Arte Dell' Attore.* Rome: Bianco e Nero, 1950. 333 p.

An anthology of some of the most basic statements about the art of acting, one part dealing with stage-acting, the other with screen-acting. Each selection has an informative introduction. Among several others of equal value one finds the thinking of Hegel, Diderot, Morrocchesi, Stanislavsky, Jouvet, Pirandello, Bette Davis, Kuleshov and John Barrymore. The material offered is analyzed and synthesized by the editors: (a) Chiarini discussing the affinities and the differences between stage- and screen-acting, while (b) Barbaro concerns himself with "l'attore creatore."

DAS, J. *Wijen de Film.* Baarn: Bosch & Keuning, 1950. 78 p.

Film must really be penetrating to levels of our society hitherto thought invulnerable to it; no other reason can account for the fact that even the most fundamentalist Calvinist faith of the Netherlands, the *Gereformeerde Kerk*, felt called upon to define its position in relation to it. This book tries to raise elementary critical standards of film, mainly to raise the level of film-

reviewing in the *Gereformeerde* press. The book makes an attempt to absolve film of some of the blame that has become attached to it in the circles of this particular form of religion. The writer still has a long way to go, but considering his point of departure, the long way he has come already is certainly praiseworthy.

ECKERT, GERHARD. *Die Kunst des Fernsehens: Umrisse einer Dramaturgie.* Emsdetten (Westf.): Lechte, 1953. 105 p.

This is an early German attempt at formulating a theory of television; its subtitle calls it an outline for a dramaturgy. Its author has been writing on the subject of radio, film and television communication since the middle 30's in Germany. The thesis of the book is that television is primarily a unique dramatic problem and cannot be adequately explained in terms of radio, film or theatre. The main stress of the book falls on the differences the author enumerates as existing between film and television, many of which differences are debatable. The author also supplies a set of comprehensive rules which television programs ought to obey.

FAURE, ELIE. *Fonction du Cinéma: De la Cineplastique à son Destin Social.* Paris: Librairie Plon, 1953. 117 p.

Here in one volume are collected all the writings on the subject of film by the great French art-historian. These essays and excerpts up to now were scattered through various works. The editors, who are in the process of publishing the definitive edition of Faure's work, performed a needed service by bringing these easily forgotten but hard-to-ignore views on film together. Chaplin, to whom one of the essays is devoted, in his introduction to this volume calls Faure the first man to recognize in film one of the great forms of art, and he praises Faure, rightly, for his humanity and his poetic imagination. Some of the subjects covered in the essays are: (a) Tintoretto and the film, (b) dance and the film, (c) the destiny of the film, and (d) Faure's key statement on cineplastics (which was published in an American edition in 1923, now long out of print). All of the essays, needless to say, deal in one way or another with the relation of the plastic arts to film.

FLORES D'ARCAIS, GIUSEPPE. *Il Cinema: Il Film nella Esperienza Giovanile.* Padua: Liviana, 1953. 299 p.

An exhaustive, well-documented work on the subject of film and youth. It seems to be a creative synthesis of most of the recent European studies in this field. While it is loaded with references, it appears to be an integrated, highly-organized study with a definite point of view. The book has four parts: (a) phenomenology of the film, (b) the filmic experience, (c) the film as art, and (d) the educational film. There is an appendix about radio and youth. From the footnotes one can surmise that there was little of relevance missed by the author.

FORD, CHARLES. *Le Cinéma au Service de la Foi.* Paris: Librairie Plon, 1953. 255 p.

Another book indicative of the convergence of Catholic thought on the problems posed by film. Charles Ford is a film-historian of merit. (With René Jeanne he is engaged in writing the impressive *Histoire Encyclopédique du Cinéma.*) While the Ayfre volume represents the aesthetic approach, this book, titled *The Film in the Service of the Faith,* is primarily a history and a source-book. The main reason for the renewed Catholic interest in film

becomes clear after reading the key chapter of this book, which reprints the 1936 Encyclical Letter "Vigilanti Cura" of Pope Pius XI, and analyzes its implications, which the author believes have been neither interpreted nor understood properly. The body of the book is devoted to a detailed historical and critical consideration of religious films since the birth of film. There is a chapter on collaboration between the various faiths in regards to film. The functions and activities of the International Catholic Film Office, and its national subsidiaries, are given careful scrutiny.

MAY, RENATO. *L'Avventura del Film: Immagini-Sonore-Colore.* Rome: Ateneo, 1952. 204 p.

A further theoretical study into the possibilities of film by the author of the well-known *Il Linguaggio del Film* (Milan: Poligono, 1947), which dealt mainly with the theory of film editing. This present work can be considered an extension of the earlier volume. It takes up the evolution of the language of film, this time with particular regard to its sound and color dimensions. May considers all the familiar, but still largely unanswered questions: (a) the role of association as a structural element in film language, (b) the relations between spectator and film image, (c) the functions of camera and microphone as instruments to reproduce both the physical and the psychological world, etc. The final chapter is undoubtedly of the greatest importance; it deals with the practically ignored factor of color in film, and its effects on editing, directing, and composition.

MEYERHOFF, HORST. *Tonfilm und Wirklichkeit: Grundlagen zur Psychologie des Films.* Berlin: Henschel, 1950. 96 p.

This book, titled *Soundfilm and Reality: Bases for a Psychology of Film,* has as its purpose to consider the relation of film to reality from a psychological-biological point of view. The writer claims that too much has been taken for granted about this "obvious" relationship. He discusses, in turn, (a) the function of movement in the film image, (b) the principles of perception, (c) the implications of the omnipresence of the camera, (d) the problem of identification, (e) the illusion of reality, (f) the relation between the reality characteristics of film and naturalism, (g) sound and image, and (h) the role of the spectator. Meyerhoff ends with a cultural-philosophic view of the matter at hand. For a book covering this kind of material, it is unexpectedly and delightfully straightforward and easy to follow. The question remains: How true is it?

SOURIAU, ETIENNE, editor. *L'Univers Filmique.* Paris: Flammarion, 1953. 210 p.

A collection of studies of aesthetic aspects of film which grew out of research carried on at the Paris *Institut de Filmologie.* The editor, a specialist in the affinities of the arts (*La Correspondance des Arts.* Paris: Flammarion, 1947), supplies an extensive introduction outlining his concept of the filmic universe, and defining a number of new terms such as: *afilmique, diégèse, écranique.* A description of the working methods of the *Institut* makes clear that, rumors to the contrary, film is *not* studied there with one's back to the screen, although the proper use of the word "séance" for these study-sessions is slightly disconcerting. The team of researchers that contributes to this volume covers a variety of subjects: (a) the expressive values of costume, (b) poetry of the film, (c) appearances of believability, (d) the activity or passivity of the spectator, (e) sequence and simultanëity, and (f) the reversion of filmic time. This is the kind of study easily ridiculed by film-makers, that yet may turn out to be of the utmost importance to them.

STEPUN, FEDOR. *Theater und Film.* Munich: Hanser, 1953. 164 p.

A new, revised, and much enlarged edition of a book originally published in Germany in the early 30's and promptly banned by Dr. Goebbels. Mr. Stepun has a wide background in the theatre of Russia, Germany and Switzerland. Following the Revolution he was a director in the exciting Russian theater of that day, a colleague of Stanislavsky. The book found its origin in a series of lectures given then, which were concerned with the theater's failure to represent the tragedy of our times adequately and the film's apparent ability to do just that. Mr. Stepun has learned a lot since then. His book tries to answer the question whether film is a new form of theater, or whether it is, in fact, the anti-theater. It does so by an excellent comparative analysis of both arts. Its conclusions may be arguable, but it makes worthwhile reading, nevertheless.

TARRONI, E., and PADERNI. *Cinema e Gioventù: Studio degli Aspetti Sociali e dei Motivi d'Interesse.* Rome: Instituto di Pedagogia, 1952. 163 p.

A publication of the Educational Institute attached to the University of Rome. This book contains a study of the social aspects of the problems of film and youth, with an emphasis on the film preferences shown by young people. The investigation was carried out through an analysis of questionnaires; much statistical material is given. There is a long preface by the director of the Institute, Professor Luigi Volpicelli.

VERDONE, MARIO. *Gli Intellettuali e il Cinema: Saggi e Documenti.* Rome: Bianco e Nero, 1952. 259 p.

This is a unique collection of essays and documentary materials proving that intellectuals of all kinds have been interested in film from its beginning. Mr. Verdone has brought together a fascinating array of statements by some of the most unexpected people, illuminating many little-known aspects of the general development of film. It appears that in the early days of film serious thinkers showed more concern with the new medium than is usually assumed; though it was not always constructive concern, to be sure. The writer's text puts the documents—all translated into Italian—in their proper perspective. The book begins with Baudelaire's outline of an esthetics of photography, published in 1859, and ends with James Agee's commentary to *The Quiet One.* In between these two one will find such miscellaneous items as Henri Béraud's conversations with Lumière, excerpts of D. H. Lawrence's "St. Mawr," Serge Lifar on film and dance, the views of De Amicis of 1907, a letter of Croce, an essay by Chesterton on film editing, and many more of equal interest. Mr. Verdone has made a singularly valuable addition to film literature.

WINDISCH, HANS. *Schule der Farbenfotografie.* Seebruck am Chiemsee: Heering Verlag, 1952. 226 p.

This is the fourth, revised and enlarged edition of a handbook on color photography that is widely used in Europe. Windisch believes that books of this kind don't have to be unreadable in order to inspire confidence. The book is comprehensive in scope, yet down-to-earth in its approach and easy to read. The content ranges from the physical and physiological bases of color to the expressive use of color in film, the "orchestral" use of color in composition. The production and layout can serve as a model for books on this subject. It contains 56 full page color illustrations.

Other Books of Equal Merit but Without Comment

AGEL, HENRI. *Le Cinéma: A-t-il une Ame?* Paris. Editions du Cerf, 1952. 119 p.

BRANCA, REMO. *Questioni del Cinema.* Rome: Biblioteca Nuovo Cinema, 1952. 212 p.

CLAIRE, RENE. *Reflexion Faite: Notes pour Servir à l' Histoire de l' Art Cinematographique de 1920 à 1950.* Paris: Gallimard, 1951. 270 p.

COSTADAU, MAURICE and NADEL, CHARLOTTE. *Carrières du Cinema.* Paris: Lamarre, 1951. 106 p.

COTTONE, CARMELLO. *Cinema Educativo e No.* Rome: Signorelli, 1952. 97 p.

DEUTSCHE FILM—A. G. *Auf Neuen Wegen: 5 Jahre Fortschrittlicher Deutscher Film.* Berlin: Deutscher Filmverlag, 1951. 220 p.

FORSELL, LARS. *Chaplin.* Stockholm: Wahlström & Widstrand, 1953. 119 p.

FRANK, NINO. *Petit Cinéma Sentimental.* Paris: La Nouvelle Edition, 1950. 229 p.

FRANK, NINO. *Cinéma dell' Arte.* Paris: André Bonne, 1951. 192 p.

GILSON, PAUL. *Ciné-Magic.* Paris: André Bonne, 1951. 180 p.

GORTER, WOLFGANG. *Wir vom Bergfilm.* Munich: Rother, 1951. 48 p.

GROMO, MARIO. *Robert Flaherty.* Parma: Guanda, 1952. 62 p.

GUERRASIO, GUIDO. *Il Cinema, la Carne e il Diavolo.* Milan: Museo del Cinema, 1950. 94 p.

HES, J. A. *Kerk en Film.* The Hague: Boekencentrum, 1951. 67 p.

HULSING, BER. *Charles Spencer Chaplin en Charlie.* Amsterdam: Pegasus, 1953. 168 p.

IDESTAM-ALMQUIST, BENGT. *Eisenstein: Ett Konstnärsöde i Sovjet.* Stockholm: KF's Bokförlag, 1951. 270 p.

LANOCITA, ARTURO. *Cinema: Fabbrica di Sogni.* Milan: Signorelli, 1950. 136 p.

LAURITZEN, JENS CHR. *Filmen.* Copenhagen: Schonberg, 1950. 169 p.

LIZZANI, CARLO. *Il Cinema Italiano.* Florence: Parenti, 1953. 319 p.

MONTANARI, MARIO and GUIDO, RICCIOTTI. *La Disciplina Guiridica della Cinematografiia.* Florence: Cya, 1953. 2 vols.

MORALES, MARIA LUZ. *Il Cine: Historia Ilustrada del Septimo Arte.* Barcelona: Salvat, 1950. 3 vols.

NEERGAARD, EBBE. *Filmkundskab: En Introduktion.* Copenhagen: Gyldendal, 1952. 144 p.

OSTEN, GERD. *Nordisk Film.* Stockholm: Wahlström & Widstrand, 1951. 120 p.

PINA, FRANCISCO. *Charles Chaplin: Genio de la Desventura y la Ironia.* Mexico, D. F.: Aquellare, 1952. 259 p.

POIRIER, LEON. *Vingt-Quatre Images à la Seconde.* Paris: Mame, 1953. 267 p.

ROGNONI, LUIGI. *Cinema Muto: Dalle Origini al 1930.* Rome: Bianco e Nero, 1952. 237 p.

SADOUL, GEORGES. *Vie de Charlot: Charles Spencer Chaplin Ses Films et Son Temps.* Paris: Français Réunis, 1952. 207 p.

SADOUL, GEORGES. *Le Cinema Devient un Art: 1909-1920.* (Vol. III of his *Histoire Générale du Cinêma.*) Paris: Denoël, part 1, 1951; part 2, 1952.

SADOUL, GEORGES. *Panorama du Cinéma Hongrois.* Paris: Français Réunis, 1953. 62 p.

WALDEKRANZ, RUNE. *Le Cinema Suédois.* Stockholm: Institut Suedois, 1953. 66 p.

WALDEKRANZ, RUNE. *Italiensk Film.* Stockholm: Wahlström & Widstrand, 1953. 214 p.

ZAVATTINI, CESARE. *Umberto D.: Dal Soggetto alla Sceneggiatura.* Milan: Fratelli Boca, 1953. 141 p.

NOTE: All the books mentioned in this and in previous columns are available from the library of the University of Southern California under the inter-library loan system.

BOOK REVIEWS

BERELSON, BERNARD. *Content Analysis in Communication Research.* Glencoe, Illinois: The Free Press, 1952. 220 p.

Reviewed by

● REUEL DENNEY

This well-packed and well-organized display of the strategies of content analysis is remarkable chiefly for its brevity. In 198 pages, the reader is provided with a reliable grasp of the field as it has developed so far, and at the same time acquainted with some of the major methodological spooks that haunt it. The text is rich in illustrative materials and it is supplied with an unusually sophisticated bibliography—one can find references to the rhetoric of the Greeks in it, if one looks in the appropriate place. While it has the ring of a retrospective work, as if the discipline of content analysis itself were in the midst of a stock-taking pause, it also takes the responsibility of pointing to less-than-satisfactory formulations of method, and suggests some questions that ought to be looked into.

True enough, the wagons that the steed of content analysis has been hitched to, still overdetermine its pace and direction. Because it has been heavily involved in the work of analyzing states of political opinion, as represented—or wilfully misrepresented—in the massive media, it tends to be involved in the examination of the polemic, the explicitly argumentative. At the same time, the range of possible definitions of the unit of content that can and must be defined and counted, seem correspondingly limited. In most of the examples presented in this book the unit is nothing more or less than an expression of some set problems in the political

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and cultural sciences. Students of the media count unit emphases on murder in a given newspaper as contrasted statistically with unit references to political coverage in the same paper. Students of national morale count emotive terms in Hitler's remarks and emotive terms in Roosevelt's. The inevitable result is that content analysis, far from being a partial savior of political science, as Lasswell wanted it to be, is also a victim of the field to which it extends a hand. By and large, one gets the impression that content analysis has been used as often to maintain an interest in some hackneyed formulation of political science as it has been to acquire data that might disturb the hackneyed formulations.

This is not to say that content analysis has been applied only to the political arena, or that it is so represented by this book. This study is representative and fair in its inclusion of a number of types of content analysis—involving movie themes, fictional themes, the forms of oratorical appeal and so on—in which counts of units are not necessarily directed toward a words-are-weapons conclusion. Here, however, this study takes a curious stand in its use of quantitative as contrasted with qualitative analysis. The author suggests that qualitative analysis has perhaps seven traits that mark it off from the quantitative brand: (a) Much of it is only quasi-quantitative, (b) It is often based on presence-absence of certain content, rather than relative frequencies, (c) It is exercised on small or incomplete samples, (d) It contains a higher ratio of non-content to content statements than quantitative analysis, (e) It is concerned less with content, as such, than content as representative of some other variable, (f) It employs less formalized categories, and (g) It utilizes more complex themes than quantitative analysis.

This is an excellent empirical description of many of the traits that serve to distinguish from quantitative analysis another visible type related to it, but different. However, if quantitative and qualitative analysis *both* work with *units* in a *universe*, then the distinctions set forth above should be expressible in terms of the way that units and universe change when going from quantitative to qualitative studies. Thinking of it in this way, it is hard to know what quasi-quantitative means, except a weakness for saying most of instead of 75 percent of. Again, presence-absence of certain content appears to this reviewer to be a type of frequency. As for size of sample, all that the distinction offered here means is that when a qualitative content analyst examines the themes in Jane Austen's novels he leaves the theme content of *all other* novels as an implicit rather than an explicit boundary of his universe. Distinction (d), that qualitative analysis contains a higher ratio of non-content to content statements than quantita-

tive analysis—seems to me to be a distinction achieved by way of begging the question that is involved. That is, it defines qualitative analysis from the point of view of quantitative analysis—a point of view from which quantitative analysis could not be uncircularly defined itself. The same stricture would apply, I think, to distinction (f), where formalized is made identical with the categories of some sort of structural-functional sociology, as if other categorizations were somehow less formalized. Finally, it must be admitted that what Berelson calls qualitative analysis does appear to exercise itself on more complex themes than quantitative analysis.

All this is meant to lead up to the suggestion that it might be more fruitful to use the term qualitative to refer, in a phrase such as qualitative analysis, to any form of analysis which attempts to measure units of form as well as of content in a given universe. Berelson has pointed out, albeit indirectly, that qualitative analysis is often, perhaps always, concerned with form—even though this does not always become explicit. Why not accept a form-content distinction? Why not proceed from it to the notion, already demonstrated, for example, in counts of the types of arguments in Attic orators, that units of form are as easy to formalize in definitions as units of content? Mark Benney has pointed out in a seminar at the University of Chicago, that it is perhaps *easier* to count camera angles, movements and durations in movies than to count their themes. Here is a clear-cut case in which aspects of form appear to be more accessible to unitisation than aspects of content. It is along such lines that this book seems to look back to old banalities in the field more forcefully than it looks forward to new possibilities. Perhaps the precise value of this volume lies in the frankness with which it exposes some of these definitional bugbears.

It should be said, in conclusion, that this study is unusual in the degree to which it tips off its readers to its theoretical underpinnings and side-pinnings. As the mathematical theorists of communication argue, all analysis of a communication after the event tends to involve some reasoning backward to prior probabilities. This study not only concedes, but refines, our recognition of this point. As the linguists have shown, much meaning in language is super-personal; and this insight is recognized in this volume by reference to Ithiel Pool's formulation that content analysis should perhaps be most directed toward the examination of what the communicator can least personally control. Again, this study concedes quite clearly that all content analysis depends on assuming a cultural homogeneity among communicators and audience—a homogeneity that is the easiest thing to assert about a culture and the hardest thing to prove about it.

It is perhaps only by cross-reference to current literary studies that this book suffers a kind of deafness. It lacks due recognition of the fact that one of the hot cores of modern literary theorizing involves an issue that is at stake here, namely, the status of artistic fiction as contrasted with fiction. Such an issue is of the highest importance in assessing the metaphorical content of discourse directed toward apparently informational and practical ends. It is possible that the assertive form-content dualism of an Aristotle provides more handles for this problem, since it defines fiction in terms of form rather than in terms of content, than most other systems. Without such a common-sense distinction, what would the status of the term content be? It would vanish in a monism.

EAST, MARJORIE, and DALE, EDGAR, editor. *Display for Learning*. New York: The Dryden Press, 1952. 306 p.

Reviewed by

● ROBERT de KIEFFER

Display for Learning makes a noteworthy contribution to the literature in the audio-visual field by compiling a large number of very helpful ideas and techniques concerning the production of display materials. The extent of its contribution for classroom teachers will depend, in large measure, upon its use in pre-service and in-service teacher training programs.

The author, Marjorie East, with the assistance of Edgar Dale, the editor, have combined their talents in presenting a volume which blends practical "How to do it" suggestions with the theoretical aspects of learning and teaching. The reader encounters no difficulty in traveling from chapter to chapter because a line of continuity is maintained by constant summary and projection. Pictorial materials and illustrations are liberally used to emphasize and clarify concepts and to exemplify specific references in the text. It is doubtful that this volume will replace any of the multi-purpose audio-visual texts currently in use; however, it is definitely a book which will be of great value as supplementary reading.

The book is aimed at accomplishing three major tasks: (a) to describe in clear, concise steps how various types of simple visual material can be made by teachers, (b) to point out that visual material can be economically produced and effectively utilized on

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a limited budget, (c) to emphasize that teacher imagination, initiative, and interest in the communication of ideas, rather than artistic ability, are the primary ingredients for the production of materials to meet specific instructional problems.

The title, *Display for Learning*, is catchy, but misleading. The volume might better have been identified by its sub-title "Making and Using Visual Materials." The author, having selected the word "display" as the central theme of the book, has gone to extremes in defending her position that almost every audio-visual medium is a display. According to her definition, a display is "a careful arrangement of materials for others to see" (p. 12). In elaborating the meaning of this word, the author has included such media as drawings, chalkboard presentations, models, mock-ups, exhibits, slides, flannelboards, and even duplicated materials. Although the adherence to this terminology seems to be used as justification for the book, it has in no way hindered the clear organization and effective style of the author.

The volume contains 17 chapters, but is divided into the following five basic parts: (a) Theory of Display, (b) Materials for Display, (c) Design for Display, (d) Medium for Display, and (e) Appraising Display.

Theory of display. The first section concerns itself with the "why" and the "how" of display techniques. In a very convincing manner the author describes how displays can help people learn, how displays can be used as a method of communication, and how people can protect themselves from being improperly swayed by understanding display techniques.

The second chapter, How Do We Prepare Displays, lays out the basic philosophical organization of the book. The author emphasizes there is a formula which can be applied to display construction. The first step in applying the formula is understanding of the display problem. This understanding results from a careful consideration of three items: (a) know your audience, (b) identify your specific purposes, (c) develop plans for audience participation.

When the display problem has been carefully analyzed and plans outlined, the second part of the formula can be applied, namely the translation of plans into visual symbols. This procedure involves the selection of materials, the use of the principles of design, and the selection of the most effective media to communicate ideas.

The continuous re-emphasis, throughout the book, for the need of having a plan in developing and using visual materials indicates that the author is not concerned with gadgeteering, but is funda-

mentally interested in an organized approach to local production and effective utilization.

Materials for display. With a thorough background of sound planning which is necessary for building and utilization of displays, the reader is introduced to the second section which deals with various types of display materials, their selection and use. Materials which are discussed include objects, specimens, models, pictures, clippings, drawings, graphs, charts, diagrams, and the composition and lettering of the copy. In each instance, considerable space is devoted to what the medium is, why it is used, and how it should be selected and used. In areas where certain skills or techniques are involved in preparing materials, such as lettering, picture mounting, and layout, many simple, practical, and helpful ideas are presented. The chapter on drawing, like most discussions on the subject, fails to give any basic method or assistance in making three-dimensional drawings that will really teach. Instead, stick figures and line drawings are recommended. This suggests that teachers are either hopelessly incapable of producing three-dimensional drawings, or that no logical method has been devised for the teaching of audio-visual drawing.

Design for display. The third section, Design for Display, deals with the tools and rules of design. Although these elements are foreign to most teachers, they are essential to the effective use of display techniques. Much of this information can be found in books on art, advertising and layout, but rarely has this subject been treated in a manner which applies so directly to the everyday work of the teacher. In clear, terse yet descriptive language the author discusses ways and means by which displays can be made more meaningful through the careful use of the basic elements of design.

Below is a diagrammatical representation of the tools and rules of design which are elaborated in detail in the book.

The Tools of[1] { *space*, *line*, *color*, *shape*, *texture* } *show*

- *similarity through* { *Repetition*, *Unity*, *Formal Balance* }
- *difference through* { *Informal Balance*, *Contrast* }

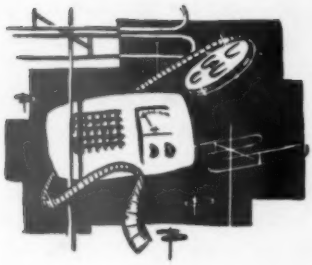
[1] p. 175

Mediums for display. Having discussed the materials for display and designs for display, the fourth section of the book brings these two elements together in describing their use in developing complete displays using various media. As the book states, "Just as the stage, the motion picture and the radio are different mediums for drama, so there are several mediums for display." The mediums described are those most readily available to teachers including duplicating processes, chalkboard, slides, posters, charts, bulletin boards, and exhibits. With simplicity yet thoroughness the author describes the "what," "why," and "how" of each medium along with many helpful suggestions on techniques of construction.

Appraising display. The final section integrates closely related items which have been discussed throughout the volume.

This is not only an effective summary, but gives the reader some concrete suggestions on how to evaluate his own display techniques and those of others. The two basic factors described in appraising display are to study the display itself and to study the people who see the display. With a word of caution the author closes the book by stating, "As you work with display you will find that it can't move mountains, but it can, perhaps, move one molehill at a time."

Every person engaged in the preparation and use of displays which are intended to improve instruction or communicate ideas should be encouraged to read *Display for Learning*.



FILM REVIEWS

THE GLOBE PLAYHOUSE. (University of California, Los Angeles; Los Angeles, California.) 29 minutes, 16mm sound, black and white. $90.

Reviewed by

● ROBERT P. CRAWFORD

The purpose of this film is to help students appreciate Shakespearean drama more fully through a visual demonstration of the stage areas in a reconstruction of the Globe Playhouse. To those teachers who have had access only to models, slides, and opaques, the film will come as a welcome addition to their classroom instruction.

The picture opens to the strains of early English music, setting the stage for a filmed insert from *Henry V*, borrowed no doubt from J. Arthur Rank. We see London from a distance, and then the camera comes to rest on the Globe Playhouse with its flag flying, signalling a play today. From that point on, the picture takes us all over the theatre, telling and showing, with the help of moving models and occasionally inserted lines, how each area might be used in specific dramatic productions. The voice of the narrator is that of Ronald Coleman who adds prestige and flavor to the presentation. The film closes dramatically with a remarkably complete and effective scene from *Macbeth* which gives a unified summary to what has gone before. The producers have shown both ingenuity and imagination in their filming and scripting, leaving one with a much clearer insight as to how the Globe Playhouse

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might originally have been used for Shakespearean productions. Taken as a whole, the film was most pleasing.

However, the makers of *The Globe Playhouse* had the usual decision to make, that is, whether to let the subjectmatter take precedence over the filming techniques. Regrettably, technique interfered *not* infrequently with the learning process. Because of the rapid pace established, the eye of the roving camera goes too quickly from one level of the stage to another, with the result that the viewer gets a confused picture of the theatre. At times, too, one doesn't know whether the shots of the Globe towers were taken from the outside or the inside. One must also recognize the spotlighting of particular stage areas as being a modern method of getting attention rather than as typical of the lighting in Shakespearean times. This reviewer, however, thought that the lighting was too often in low key and needed some brightening, at least for occasional contrast. Not all of Shakespeare is sombre and dark-hued, although what was done seemed appropriate enough for *Macbeth*. We would also have liked to see what the theater looked like from the vantage point of the actors. The change in style of music at the close was just a little startling.

On the credit side, the film didn't attempt too much as is too often the case. The spoken Shakespearean lines, by unknown actors, were done tastefully and in good form. Besides demonstrating effective use of the Globe stage, the film most certainly points up some of the writing techniques employed by Shakespeare together with their necessity for the stages of the time.

The Globe Playhouse would be more useful for students studying Shakespearean plays as literature than for actors or producers, unless, of course, the students were concerned primarily with duplicating the Globe stage. And indeed, today's directors could profit from the examples of Elizabethan dispatch in setting scenes, keeping up the tempo of action, and moving quickly from one set to the next.

SKIPPY AND THE 3 R'S. (Division of Press and Radio Relations, National Education Association, 1201 Sixteenth Street, N.W., Washington 6, D.C.) 29 minutes, 16mm sound, black and white, or color. Black and white, $75; color, $170. Produced by J. P. Nicholson, Agrafilms, Inc.

Reviewed by

● PAUL R. WENDT

Paul R. Wendt is Associate Professor of Education, San Francisco State College.

The National Education Association has produced an excellent new film showing the primary teacher at work. *Skippy and the 3 R's* follows the experiences of a typical first-grader from his first day at school through several months of learning.

Skippy, played by a most engaging child, goes through the typical adjustment on the first few days of school in his strange surroundings. Gradually he gets to know the teacher, he sees his name on the blackboard, he learns to work with the other children, he discovers the value of words and numbers, he goes through a frustrating experience of wanting a bicycle, he learns to save money toward the bicycle and develops much like a normal first-grader.

The film is intended, as the title indicates, to show how the 3 R's are taught today. It is undoubtedly intended to offset some of the criticisms of present teaching methods which are based on the false supposition that if a teacher uses good motivation for children she is probably not teaching the 3 R's. This film not only shows how our good teachers today are basing the learning of the 3 R's on fundamental motivation in the children, but it also shows how the 3 R's are integrated with many other learning activities in the classroom.

The National Education Association has given a clear exposition of good modern teaching practices in the first grade. It uses over 30 minutes to make this exposition point by point. It does not attempt to show everything that goes on in the classroom nor to explain everything that appears on the screen. But it does carefully show how the modern teacher draws the child out so that he learns the 3 R's almost without knowing that he does so. It shows how the child learns the 3 R's under happy conditions so that there is less chance that he will develop emotional blocks against learning.

In any film showing the classroom teacher, the greatest problem has always been to cast the principal role of the teacher. In this film the teacher is played by a very pleasant actress, with a nice smile, who conveys the impression to the audience of a thoughtful and resourceful individual. She watches Skippy to find out what makes him tick. She sees his interest in the bicycle and uses this as a means of drawing him into group activities. To a teacher in training, she must make teaching appear almost effortless, but on the other hand it is a common experience for teachers in training to think during their period of observation that teaching is easy and that the teacher in the classroom has very little to do. It is only when the supervising teacher leaves the beginner for the first time in control of the class that she finds that teaching

is not as easy as it looks. Therefore, this is no criticism of the film. Teaching often does look as easy as this film makes it seem.

The children in this film are excellent. Apparently the director staged situations in which the camera could catch candid responses of the children. Perhaps the reactions of the children were not to the situations indicated in the film; in that case the film editor and director should have our congratulations on a good simulation of the real incidents. In any case the reactions of the children on the film are natural and good to see.

The film has been criticised by some viewers because it shows an ideal classroom, roomy, colorful, and equipped with all the things any primary teacher would love to have. This brings up the old question as to whether films should show situations as they are in drab reality or whether they should be idealized a little bit. Surely a classroom like the one shown in this film rarely occurs in true life. On the other hand we can dream a little, can't we?

This film should be seen by everyone interested in public education. It should be seen by every PTA in the United States. It should be seen by many groups who are uninformed and misinformed on what our teachers are trying to do. It should be seen particularly by those groups who think the 3 R's have been squeezed out of the curriculum by fads of modern teaching. This film will also be useful in education classes on elementary school methods, supervision and administration. Agrafilms should be complimented on an excellent production. Jarvis Couillard has written a script outstanding for natural dialogue and a commentary that is most convincing by its lack of salesmanship. Let us hope that the NEA can give us more films of this caliber. Public education could use them.

RESEARCH ABSTRACTS

TELEVISION

CAMPBELL, ANGUS; GURIN, GERALD; and MILLER, WARREN E. "Television and the Election." *Scientific American* 188:46-48; May 1953.

Purposes: To determine how television compared with other mass media (a) in bringing the 1952 presidential campaign to the public, and (b) in discovering what population groups were most affected by the television campaign.

Procedure: A national sample of 1714 citizens of voting age were asked by the University of Michigan Survey Research Center to state through which media (newspapers, radio, television, magazines) they had "paid attention to the campaign" and which media they considered had been most important to them.

Results: (a) In the nation as a whole, television, though available to only a minority of the people, led the other media in the numbers of persons who rated it most informative. (b) The better educated people (as compared with less educated) depended less upon television as a source of information. (c) Television has tended to replace radio as a source of campaign information more than the other media. (d) There is no clear evidence on how television affected the voting for either Eisenhower or Stevenson. (e) The study does not show whether television had a distinctive impact on voters as compared with the other media.—*William Allen.*

RIDENOUR, LOUIS N., and BROWN, GEORGE W. "Fundamentals of Subscription Television; the Logical Organization of the Telemeter System." *Journal of the Society of Motion Picture and Television Engineers* 61:183-194; August 1953.

Subscription television is the name that has been given to a system for broadcasting television programs in such a way that a person desiring to view the programs must pay for the privilege. Such a scheme should make possible much higher budgets for programs, with a consequent increase in the quality of program material.

The most fundamental problem in subscription television is that of providing a suitable method for rendering a *broadcast* television program *private.*

The problem can be considered in the following manner. The transmission of any intelligence, including visual and aural signals involved in television, requires a coding of that intelligence into a form that is suitable for transmission. The receiving apparatus then decodes the received signal, and reconstructs from it the intelligence that was encoded in the transmitter.

In subscription television, privacy is obtained by varying the encoding and decoding to some extent from the accepted standard. The nature of the departure from standard will determine the amount and complexity of the auxiliary equipment at the TV receiver to enable it to reproduce intelligible pictures and sound.

There are two general systems of subscription television: closed systems and open systems.

In a closed system, there is an additional private channel of communication between the subscriber and the encoding center. This may be a phone line which sends in a decoding signal upon demand. *Phonevision* is such a system. The closed system can also operate with the subscriber himself going to a center to obtain a decoding card. This card, when placed in the decoding unit of his set, makes the transmission intelligible. *Subscriber-Vision* is such a system.

In an open system, the information necessary to decode the transmission is broadcast within the program. The subscriber initiates the decoding activity by putting money into a box-office unit attached to his home receiver. The *Telemeter System* operates in such a manner.

Five requirements can be postulated for any system of subscription television: (a) It must operate for cash. Entertainment has rarely been sold on credit successfully. (b) Prices for individual programs must be capable of being changed in order to reflect the varied costs of production and distribution. (c) Shows must be sold on a program basis, and not on a time basis. A baseball game that goes on 12 innings must still be shown in its entirety to a viewer who has paid admission. (d) The identity, prices, and current status of a subscription television program should be announced continuously for the benefit of those tuning in the channel carrying it. This has been done by having a "barker" audio channel which can be heard before decoding. When the transmission is decoded, this channel is replaced by the program sound. (e) An accurate record must be kept of every show purchased by every subscriber. The primary requirement for such a record is that a producer of entertainment is accustomed to being paid off on a basis of a percentage of gross admission.

This paper is concluded by a discussion of a number of alternative methods for coin-operated systems in terms of the above requirements.—*E. G. Sherburne, Jr.*

FRITZ. M. F.; HUMPHREY, J. E.; GREENLEE, J. A.; and MADISON, R. L. *Survey of Television Utilization in Army Training.* Human Engineering Report 530-01-1, Special Devices Center, under contract with Iowa State College.

Purposes: To survey the field of prior research and utilization to determine the feasibility of employing television in army-training programs.

Procedure: The authors first devised a checklist with which they rated each subject in existing army curricula in terms of its suitability for televising. After a careful examination of army requirements a survey of the special advantages and disadvantages of television in meeting these requirements was made.

Results: The over-all finding is that using TV in army training is feasible. Some of the specific conclusions reached are: (a) Not more than 20 students should view one TV screen. (b) No more than four hours per day of total curriculum, and no more than 30 minutes of continuous viewing should be attempted. (c) Best instruction is informal and extemporaneous. (d) Special instructions for TV are not required. (e) Black-on-white better than white-on-black for fine-line charts. (f) Lapel microphone is best for educational TV. (g) Two TV cameras are better than one. (h) Flat fluorescent lighting is generally satisfactory. (i) TV viewing needs no special lighting in darkening of the classroom. (j) A receiver screen size of 16 inches is minimum for 20 viewers. (k) A deliberate rate of speaking is desirable. (l) Deliberate movements by the instructor are mandatory. (m) Kinescopes are complementary, not competitive with motion pictures—*Edmund Faison.*

TELEVISION PRODUCTION USING FILM[1]

Methods now being used to produce film for television can be considered to form a continuum. At one end is the standard motion-picture film technique, using a single camera for pickup and recording, with editing coming later as a separate step. At the other end is the standard kinescope-recording technique, using continuous pickup from multiple cameras, electronic editing, and simultaneous recording of the resulting presentation.

Along the continuum, there are various combinations of these two techniques, using equipment and procedures from both film and television. The following papers describe two of these intermediate points.

FREUND, KARL. "Shooting Live Television Shows on Film." *Journal of the Society of Motion Picture and Television Engineers* 60:9-19; January 1953.

Three motion picture cameras are used in filming the weekly half-hour television program "I Love Lucy." This provides more flexibility in editing, and better photographic quality than in kinescope recording.

The three cameras shoot simultaneously. The middle camera is on a long shot, and the two cameras on either side are on closeups. A crew of four men is used for each camera.

Four days are required to line up and shoot each weekly show. Two days are used by the director and cast for dry rehearsals. Two days are used for rehearsals with camera.

The actual shooting time for the entire show is approximately one and one-half hours (for a one-half hour show). Editing time is approximately four weeks. Shows seen on the screen have been shot six weeks previously.

An interesting aspect of the program is that a live audience is used. Approximately 300 people watch the filming of the show from bleachers in the studio. It is felt that this live audience stimulates the performers, in addition to eliminating the necessity for dubbing in highly artificial laughter.

(NOTE: Individual copies of reprints of this article are available at no cost by writing the Society of Motion Picture and Television Engineers, 40 W. 40th St., New York 18, N.Y.)

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[1]The following comments, abstracts, and bibliography are by E. G. Sherburne, Jr.

PALMER, W. A. "Closed Circuit Video Recording for a Fine Music Program." *Journal of the Society of Motion Picture and Television Engineers* 61:195-201; August 1953.

Six standard hour television concerts were recorded on 16mm film using closed circuit video recording in conjunction with prescoring of music. This provided the flexibility of live TV camera technique, with the editing and selection advantages of motion pictures.

Four standard TV cameras were used to pick up the pictures. Recording was done off a monitor with a special video recording camera. During takes, prescored music was played, while musicians and singers played or sang along with it. The actual sound was edited in later.

The length and method used in takes during the recording varied. Sometimes, a whole musical number would be recorded in one take, with individual shots being electronically cut in from the various cameras. At other times, only a single camera was used. Here the editing was left to the finishing operation in making up the final show, as is usual in regular film-making.

The programs were recorded in units, each unit supplying several musical numbers which could be spotted on several programs throughout the series. In this way, it was possible to have several appearances of a given artist, and achieve a greater variety in each program.

Each unit involved four days shooting, during which time enough material for one and a half programs was obtained.

Artists participating in the production had considerable enthusiasm for the method. They felt that it avoided both the intense pressure of live TV, and the boredom of painstaking motion-picture production.

Other articles of interest which directly or indirectly pertain to the production of film for television are:

ABRAMSON, ALBERT. "Television Film Recording and Editing." *JSMPTE;* February 1951.

BRETZ, RUDY. "Televising A Symphony Orchestra." *JSMPTE;* May 1953.

BRETZ, RUDY. "Television Cutting Techniques." *JSMPTE;* April 1950.

BRETZ, RUDY. "The Television Camerman." *JSMPTE;* April 1951.

COLLINS, NORMAN, and MACNAMARA, T. C. "The Electronic Camera in Film-Making." *JSMPTE;* December 1952.

FAIRBANKS, J. "Motion Picture Production for Television." *JSMPTE;* December 1950.

HOBAN, CHARLES F., and MOSES, JAMES A. "Cameo Film Production Techniques." *JSMPTE;* September 1952.

HUNGERFORD, E. A., JR. "Techniques for the Production of Electronic Motion Pictures." *JSMPTE;* July 1951.

LEFFEN, J. S. "Experimental Utilization of TV Equipment in Navy Training Film Production." *JSMPTE;* July 1951.

MOTION PICTURES

COMMONWEALTH OFFICE OF EDUCATION. *The Effective Use of Sound Films.* Research Report No. 4. Sydney, Australia: the Office of Education, May 1950.

Purpose: To discover whether the method used in presenting a sound motion-picture film affects the number of facts learned from the film.

Procedure: Six 10-minute films were presented to each of six school classes (boys in second-year junior technical schools in Sydney, Australia) using the following six different methods of presentation: (a) 10-minute introduction, followed by the film showing and immediately by the test; (b) introduction, film showing, 10-minute discussion, test; (c) introduction, film showing, immediate second film showing, test; (d) introduction, film showing, and discussion on first day, followed 24-hours later by second film showing and test; (e) introduction, film showing, class reminded that discussion would be held next day, discussion held 24-hours later, followed by second showing and test; and (f) introduction, film showing, discussion on first day, followed 24-hours later by second film showing, second discussion, and test. Pre-tests were administered to all classes a month prior to the first film showings; they were repeated as indicated for each of the methods above; finally, a delayed repetition of the test was given from 18-21 days after the last film was presented. Each test consisted of 20 objective-type factual questions. The conclusions are based on the delayed retention test results. A single investigator (who was not a teacher of any of the classes used) presented all films to all classes and conducted all discussions. The films and methods were rotated among the school classes so that each class saw all the films and was taught by all the methods without repetition of any film or method. All teaching was done in the rooms in which the classes usually saw films.

Results: (a) The most effective method (d) was to introduce the film carefully, show it, discuss it immediately, and then the next day show it again and immediately afterward test its effectiveness. This superiority was probably due to the repetition of the film (in the case of a, b, and c) and to the stage at which the discussion was held—immediately after the first screening, thus reinforcing the learning and retarding the rate of forgetting (in the case of superiority over e and f). (b) Methods e and f were about equal in their effectiveness and were superior to the first three methods. (c) Method a was the least effective method, but even it resulted in a significant amount of learning. (d) The results achieved with d were not due merely to the additional time taken with that method. (e) It appeared that dull and bright boys learned the facts in much the same relationship to one another as they do with other methods of teaching; that is, bright boys learned more readily than dull boys. (f) Boys who attended entertainment motion pictures more frequently learned more facts from the films, perhaps indicating that this practice in viewing the film medium increased their ability to learn from it.—*William Allen.*

RADIO

THE BRITISH BROADCASTING CORPORATION. *Report on Sixth Experimental Series, "The Study of the Mind" by Professor Sir Cyril Burt.* London: the Corporation, April 1951.

Purposes: To see if there is any appreciable audience outside the reach of formal adult education which will regularly listen to a series of adult educational radio talks on Psychology and to compare the reactions of these two audiences.

Procedure: The broadcasts were a series of eight radio talks on the scope and purpose of Psychology today, given by Professor Sir Cyril Burt on Mondays, 7:25 to 7:45 p.m., September 25 to November 13, 1950. The listeners were samples of parents of primary school children and of adult

students. They were administered three questionnaires and a recall test to determine their pre- and post-broadcast knowledge of the subject taught and their subjective and overt reactions to the series.

Results: "(a) There is a large audience of people outside the present reach of formal education, who are willing to listen systematically to a series of educational broadcasts. They are probably several times more numerous than those who are or have been members of educational classes, and the two, taken together, represent a potential audience of some 10 percent of the adult population. The two audiences are similar in general knowledge (at least of Psychology) and showed much the same reactions to the present broadcasts. The audience seems to expect to be instructed, not merely stimulated. About half the unattached listeners wanted to continue to study Psychology by reading books or (5 percent) joining a class, but they need guidance. (b) In this series of broadcasts on Psychology the speaker's points were grasped by large majorities of the samples of listeners. The talks, as a whole, were deeply appreciated, especially those dealing with practical problems like testing intelligence, memory, and crime. There was some evidence to suggest that listeners of this sort would prefer to hear an eminent speaker, like Sir Cyril Burt, developing a single theme (e.g. testing intelligence) rather than attempting a general introduction of the subject. Child Psychology proved to be the most interesting branch of the subject among the samples of parents. Tests carried out before and after listening to the whole series showed that the speaker was able to exercise appreciable influence on listeners' knowledge of the subject. (c) The same tests also revealed that the listener gained progressively as he listened to more talks, and that the cumulative effect was still increasing after hearing six or seven talks."—*William Allen.*

GRAPHIC MATERIALS

UNIVERSITY OF ILLINOIS, DIVISION OF COMMUNICATIONS. *How Pictures and Graphs Aid Learning From Print* Human Resources Research Institute Research Memo No. 11.

Purpose: To summarize the main experimental studies on pictures and graphs as aids to learning from print.

Procedure: The authors have abstracted over 50 studies bearing on this problem. "It is safe to say that most, if not all, experimental evidence bearing on the problem has been reviewed."

Results: The main issues (except attention and motivation) in the use of pictures and graphs have not been faced. Practically all research seeks to answer which graph or which picture was chosen, or liked. Little attention has been given to such equally important problems as: Do graphs and pictures aid retention? Who learns most from such aids? What kinds of material can be effectively illustrated?

However, there is some research indicating that for maximum results, pictures should be relevant, large enough to be read easily in detail, simple, reproduced well, realistic rather than stylized, and integrated with the text. There is also evidence that colored pictures attract more attention than black-and-white; and that the attention-attraction power varies with sex, age, and personality.—*Edmund Faison*

OTHER PUBLICATIONS

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National Education Association of the United States
1201 Sixteenth Street, Northwest, Washington 6, D. C.

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